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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

September 26, 1973 Vol. VII, No. 39

IBM Loss...User Gain?

THE DECISION
What It Says

- IBM ordered to pay Telex $352.5 million in damages, three times the actual damages of $117.5 million.
- IBM prohibited from enforcing penalties on long-term contracts; barred from offering long-term contracts with penalties for three years.
- IBM forced to release interface specifications on new products at time of announcement, and to release details on 370 interfaces within 60 days.
- IBM prohibited from offering "bundled" memories with 370 central processors, ordered to separately price CPUs and memories within 60 days.
- IBM ordered to separately price functionally equivalent units, such as tape drives and disks; ordered to use a uniform percentage markup on all functionally equivalent units.
- IBM "enjoined from adopting, implementing or carrying out predatory pricing, leasing or other acts, practices or strategies with intent to obtain or maintain a monopoly" in the peripherals area.
- Telex to pay IBM $21.9 million for misappropriation of IBM trade secrets.

(complete text of the judgment on Page 55)

Lessees Profit Now, Later Effects Clear

By E. Drake Lundell Jr.
Of the CW Staff

TULSA, Okla. – The effects of IBM's first antitrust loss in history, while giving the plug-compatible peripherals industry a needed boost, will be hard to measure in the short term for most computer users.

But the long-term effects of the decision – increased competition, stronger competitors, fairer competition – should serve to offer users more equipment alternatives in the future.

The immediate benefits of the decision are for users who have signed up for any of the IBM long-term leasing plans – the Extended Term Plan, the Fixed Term Plan and the long Term Lease plan.

The day after the decision IBM announced it had suspended collecting penalty payments specified in those plans as ordered by the judge, and if his decision is upheld on appeal, they will have to be dropped altogether.

That means users under the plan already – or those who sign up now – can get the cost breaks offered without worry over the penalties – at least not until the appeal is concluded.

Another section of the judge's decision bars IBM from any type of predatory pricing or practices in the market, which could give users who feel they are being unfairly pressured by the industry giant some legal grounds to stand on.

Analysis: What It Means

While enforcement of such provisions is often spotty at best, lawyers indicate users with complaints about IBM marketing practices in the plug-compatible peripherals area could take them to court for resolution.

"He's already found them

(Continued on Page 2)

E. Drake Lundell Jr., CW's Washington Bureau Chief and Computer Industry Editor, has been assigned to the Telex-IBM case since it was filed in Tulsa last year. In this and other articles in this issue he analyzes the decision, its implications for the user and the industry.

Other coverage of the IBM-Telex case is on Pages 2, 6 and 53.

Next Step

TULSA, Okla. – Judge A. Sherman Christensen's decision in the IBM-Telex case is only the first step in a long journey that could end up in the Supreme Court.

IBM has already stated its intention to appeal the decision, but even before an appeal is filed it is certain to ask Christensen to overrule his own decision in a court appearance here on Oct. 16.

At that time, IBM is likely to try to convince the judge that he erred in his decision or will at least ask him to stay the injunctive provisions of that ruling until all the appeals are heard.

It is likely that Christensen, legal sources said last week, will reject both those requests and order the injunctive provisions of his decision to go into immediate effect even while the appeal is heard.

(Continued on Page 2)

Independent Users: Good for Competition

By Patrick Ward
and
Toni Wiseman
Of the CW Staff

The majority of independent peripherals users was pleased with the court's ruling on the IBM-Telex suit, according to a *Computerworld* survey.

But a substantial one-third of those interviewed, felt the decision was either unfair, too harsh or contrary to the best interests of the industry, perhaps reflecting an undercurrent of sympathy for the loser.

One of those who applauded the court's decision was Loren Lathrop, manager of information services for Moog Inc. He was not only happy about the ruling, but hoped IBM would lose the appeal, too.

Lathrop expressed the hope that the decision would end what he thinks are "some of IBM's predatory marketing practices" and was certain it would be good for competition.

On the other side, Leonard Hawkins, data processing and systems manager of Rockwell Standard Brake Corp., did not feel IBM should be restricted to such an extent. "This could be detrimental to the computer community as a whole," he said.

Hawkins also expressed concern over the outcome of the Justice Department's antitrust suit, fearing an IBM breakup could also hurt users.

He agreed, however, that a long-term effect of the decision would be increased competition.

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Most IBM Users Call Ruling Justified

By Toni Wiseman
and
Patrick Ward
Of the CW Staff

The general feeling among computer users of IBM-supplied equipment is that the IBM-Telex decision was justified and equitable, according to a telephone survey conducted by *Computerworld.*

Seventy percent of those interviewed approved of the court's decision.

But users, all of whom had fixed-term or extended-term IBM leases, were not interested in terminating their leases now or in the near- to medium-range future, the survey indicated, but 40% expressed a desire to have a no-penalty termination clause in their contracts. These lessees are usually among the strongest supporters of IBM.

For the most part, the positive reaction to the decision was based not on ill feeling toward IBM, but rather on the belief that the competition spurred by the decision would be healthy for the industry as a whole.

Richard G. Arehart, for one,

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For Long-Term Users

IBM Won't Collect Lease Penalty

ARMONK, N.Y. – While contending that Judge A. Sherman Christensen's decision in the IBM-Telex case "contains serious errors of fact and law," IBM moved last week to at least temporarily implement one of the provisions of the decision.

In a letter to computer users issued last week, the firm said as of Sept. 17, 1973, it would suspend collection of penalty charges under its Fixed Term Plan, Extended Term Plan and long Term Lease Plan.

However, the firm was quick to note it was only suspending payments under the plans, and if the higher courts overruled Christensen's decision in this area later, it would collect those charges retroactively.

The move was made, the firm explained, to remove "uncertainty" in the minds of users during the "time-consuming" appeals process.

While implementing that part of the decision, IBM President and Chairman Frank T. Cary sent a letter to stockholders stating, "We are convinced that the judge's ruling against IBM goes beyond that of any judicial precedent and contains serious errors of fact and law."

"For example," Cary continued, "the damages which the judge awarded Telex are scarcely supportable under any theory. It is not completely

(Continued on Page 4)

Notice to Readers

Due to the widely publicized paper shortage, *Computerworld* may be forced to use a different grade of newsprint, temporarily.

Hopefully, this alternate supply will allow us to continue to publish our normal number of pages each week, with no reduction in editorial and/or advertising content.

In addition, in order to decrease the instances of "busy" signals, the telephone company has provided *Computerworld* with more lines. However, this necessitated our switching to a new phone exchange.

The new number is 617-965-5800, effective Tuesday, Sept. 25.

IBM's Market Strategies: 'Subtle and Sophisticated'

TULSA, Okla. – IBM's subtle predatory practices and strategies "may pose more danger" to modern industry than the more obvious agressions of monopolists in earlier U.S. history, Judge A. Sherman Christensen said in last week's decision on the Telex-IBM antitrust case.

The computer field "appears unique in monopoly context by reason of its youth and apparent dynamics," Christensen said, but "this ultra-modern setting may be unprecedented also because of increased inducements for, and vulnerability to, sophisticated submarket control on the one hand, and massive industrial espionage on the other."

Christensen noted that even within IBM it was assumed the firm had market power.

"The very predatory intent with which . . . its strategies were planned, as well as the nature and direction of its competitive responses, strongly suggest a consciousness of market power and a determination to utilize it to the extent it was considered this could be done without a breach of its confidential plans or its becoming involved in legal difficulties."

But, Christensen added, "this is not to say there were any ruthless or nakedly agressive programs contemplated or carried out; anything that was done by way of strategy was sophisticated, refined, highly organized and methodically processed and considered.

"But in this day and age such conduct is hardly less acceptable than the naked aggressions of yesterday's industrial powers if unlawfully directed against competition.

"The organized, selective, subtle and sophisticated approach, indeed, may pose more danger under modern conditions than instantly more obvious strategies," Christensen warned.

In a modern field such as the computer area, he said, "antitrust applications and interpretations must not be inextricably tied to entrenchments of long standing when the monopolization can be accomplished in modern context and particularly in such industries as the EDP industry by fast acting strategies and sophisticated selectivity . . .

"It is no answer to say that this industry is the youngest in which monopolization has ever been found because it might also be said that here rewards from monopolization may be among the highest and the opportunity in view of its rapid technological and market developments perhaps among the greatest," he said.

IBM's claim that all of its actions with regard to the plug-compatible manufacturers were just competitive responses might also be subtle ways of maintaining a monopoly, Christensen found.

"Claimed necessity of responding to competitive influences beyond the control of the alleged monopolist may be only its excuse for anticompetitive conduct for the purpose of maintaining or extending monopoly power or to surmount threatened competition," he said.

"Sophistication of users or competitors may discourage monopoly but equal or greater sophistication on the part of the alleged monopolist may be a counterbalancing factor, and industry dynamics may continue in evidence through technological momentum beyond the inception of monopoly."

In applying the antitrust laws, especially to new or novel situations of the nature presented here," Christensen said, "courts should be especially sensitive to their broad policy, mindful of economic realities in the marketplace, hospitable to healthy economic practices and developments, inhospitable toward subterfuge and pretense."

In addition, he said, they should be "practical as well as vigilant, in avoiding control by mere custom, form, appearance or contrivance. Fair and reasonable business practice should be the watchword, predatory conduct a red flag, considerate judgment the measure and free and unfettered competition . . . the large objective."

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E. DRAKE LUNDELL JR., *Washington bureau.* MARVIN SMALHEISER, *West Coast bureau.* J.H. BONNETT, *European bureau.* HIDETSUNA SASAKI, *Asian bureau.*

CONTRIBUTORS: J. DANIEL COUGER, *education column;* FRANK GREENWOOD, *management column;* ALAN TAYLOR, *Taylor Report* and *professional practices.*

NEAL WILDER, *vice president – marketing.* DOROTHY TRAVIS, *marketing administrator.* JUDY MILFORD, *advertising coordinator.* KATHRYN V. DINNEEN, *market research.*

LEETE DOTY, *production manager.* HENRY FLING, *production supervisor.*

W. WALTER BOYD, *publication manager.* PATRICK J. McGOVERN, *publisher.*

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. **Washington:** Room 1129, National Press Bldg., Washington, D.C. 20004. Phone: (202) 638-0901. Telex: 89-544. **Los Angeles:** 963 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. **Europe:** Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England. Phone: 01-242-8908. **Asia:** Computerworld, c/o Shukan Computer, Dempa Building, 1-11-15, Higashi Gotanda, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. ©1973 by Computerworld, Inc.

25 cents a copy; $9 a year in the U.S.; $10 a year in Canada; all other foreign, $25 a year. MARGARET PHELAN, *circulation manager.* Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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Independent Users: 'More Competition'

(Continued from Page 1)

"I'm please with the decision," said Bob Brainard, American Greetings Corp.'s director of DP. "I felt it would go this way because of market definition." He thought the decision would make for a better environment to work in. "It will remove inhibitions in the marketplace," he said, because "the rules of the game have changed."

"This will certainly make IBM start playing a little fairer," agreed Robert Worthy, senior systems programmer with Bell Helicopter Co. "The whole industry will benefit."

Joseph Haren was another pleased user. "If it had gone the other way it would have been a blank check for IBM to continue as it has in the past," the First National Bank (Ohio) DP officer said.

A couple of users felt the financial award was too high, but the main dissenters agreed with Hawkins that the restrictions placed on IBM were too harsh.

Emil Pieper, director of DP, Rochester (N.Y.) Hospital Services, said, "I think IBM was guilty of indiscriminate pricing," but he stressed that he thought some parts of the ruling were unfair to IBM.

"Although the decision might prolong the life of the 360," one user said, "it will certainly retard the growth of the industry as a whole." He termed the judgment as "pretty poor."

Better Equipment?

The survey asked, will the additional competition lead to lower prices on better or equal equipment?

"You bet," Worthy said, "because now IBM will be in the same situation as the independents have been right along with regard to what new peripherals are coming out and at what prices."

Jerry Hammer, DP supervisor, Getty Oil Co., does not foresee better equipment because "independents are supplying as good or better peripherals as IBM now," but predicted a price reduction on all sides.

"We should see some equally good equipment at lower prices," Jerry Kramer agreed. The Marathon Oil Co. computer manager also expects some short-term effects on IBM, such as fewer early announcements.

"Either faster technological advances or better pricing or both will result from this decision," Hawkins said.

Independent Revolution?

Will independent peripherals be more attractive to users and upper-management be more open-minded to independent peripheral acquisition?

"Few people who have an IBM installation and receive an offer for 10% less than IBM prices will jump," stated Nick Suszynski, DP manager, Federal Deposit Insurance Corp. "Why rock the boat? Ten percent isn't that attractive," he said, "and certainly not attractive enough to outweigh IBM's proven reliability."

Even Out the Money

Joseph Dolden, director of computer services, department of administrative services (Georgia), feels financial inhibition and not lack of opportunity is what has kept the independents where they are. "Smaller OEM and peripheral companies will now be able to present a stronger, more stable position to the marketplace," he said, "providing they can get the financial backing to do so."

Suszynski agreed, citing the jump in stock market prices for independents as proof. "Judging from the reaction of the marketplace," he said, "the people who are willing to put their money where their mouths are, are certainly changing their previous opinions in a hurry."

The survey indicated many users did not feel the decision would have a marked effect on IBM's position in the marketplace, though undoubtedly there would be some long-term consequences.

"If the decision is such that it makes it easier for independents to compete, it might help them," Lathrop said, "but if it has no effect on IBM's marketing practices, I don't see how it is going to help the independents unless they all sue IBM and get rich that way."

No Drastic Changes

Brainard was of the same opinion, stating that if the decision had gone the other way it would have scared off many people from going independent, but this way he does not foresee any drastic changes in the near future, "no quick tip of the market to the independents."

One overwhelming feeling indicated by the survey was one of benevolence toward the loser, summed up by Hawkins who said, "I don't want to kill IBM, I'd just like to see others live in the same world."

Long-Term Benefits Apparent

(Continued from Page 1)

guilty of monopolization and attempted monopolization in this area, so a user would only have to prove . . . they had acted in a predatory manner," one lawyer noted.

The rest of the provisions in the judgment are aimed strictly at giving additional relief to the plug-compatible industry, and to the extent that it strengthens this group users should benefit in the long run.

The provision requiring IBM to release interface specifications at time of product announcement will allow the independents to reach the market with new products at the same time as IBM – which will give users a choice of products for their systems from day one, instead of having to wait for alternatives to IBM.

The provision should also cut down on the practice of mid-life kickers to products that often served almost solely to confuse the marketplace – both from the user standpoint and the industry.

Separate pricing and uniform markups on functionally equivalent products will also serve to prohibit or cut down the IBM practice of taking a low profit on devices with competition while taking a larger one on products without competition, which in the long run could serve to lower the cost of data processing for all users.

But right now the full effect of the decision is hard to estimate fully. Certainly, no matter how its spokesmen talk, IBM will still remain the dominant force in this industry even if all of the provisions of the decision are upheld on appeal.

But, if the decision stands, the options offered by the competitors in the plug-compatible area should improve as the firms become more viable in the market.

Next: IBM Will Seek a Reversal

(Continued from Page 1)

The next step will be the Tenth Circuit Court of Appeals sitting in Denver, Colo., a court known among lawyers as eminently fair, even if somewhat conservative in antitrust actions.

"The court will primarily look at the record of the case, and based upon its past actions, is likely to uphold the trial judge if it finds no irregularities in the way the case was handled," one legal source said.

Whichever way the appeals court rules, it is then almost certain the loser there will take the matter to the Supreme Court, which can either decide to hear the case or in effect uphold the Circuit Court by refusing to hear the motion.

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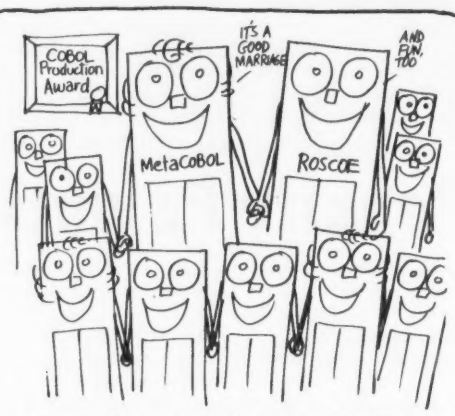

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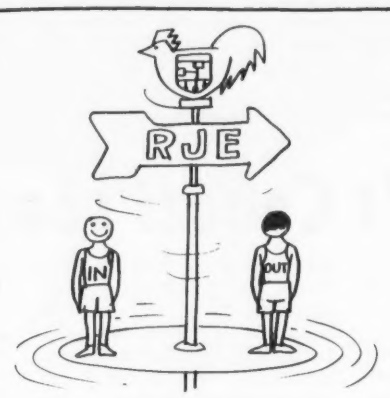

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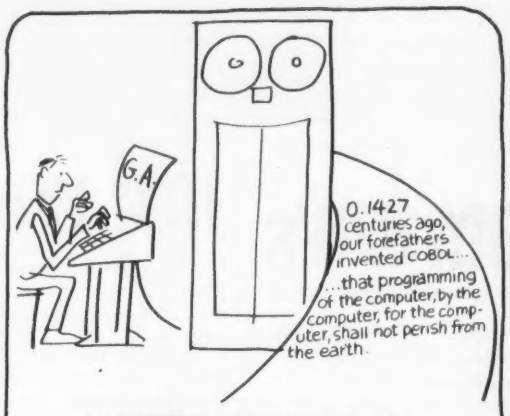

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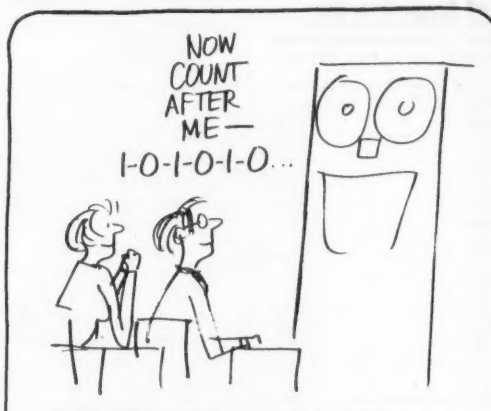

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IBM 'Supporters' Call Ruling Justified, 'Healthy'

(Continued from Page 1)

felt "it will take a little wind out of their sails (sales?)." Arehart is vice-president and EDP director for Super Foods Serving, Inc., Ohio.

"I like IBM pretty well, but I like to see competition to keep IBM on their toes," said Tom S. Griggs, DP director for Bridgeport (Conn.) Hospital. "That way I get a better IBM product. The healthier the other manufacturers are, the better it is for me."

George L. Thompson, director of computer applications at Olin Mathieson-Winchester Group, said: "The decision is a shot in the arm for the plug-compatible industry. This means that peripheral manufacturing is now a viable industry and there will be a choice of IBM or non-IBM peripherals, a situation which faced extinction without the decision."

'Unfair' to IBM

Thompson, however, said he thought the penalty was a little high, a feeling expressed more vehemently by three other users.

"I don't think the decision was fair to IBM," noted Dennis Hartman, manager, systems programming, Colorado Computer Center, "because I don't think they were involved in monopolistic practices."

"I disagree with it," said Richard Green, executive vice-president, Datamation Services, Inc., "it's just hurting somebody for being good at their job. All it accomplished was to save a sinking ship from going under."

Frank P. Janik, assistant specialist in systems development for United Nuclear Corp., concurred, stating "IBM has accounted for 90% of the industry's growth. They've done a great deal for the computer industry and I don't think it's fair to impose the penalty."

Janik further doubted the benefit to competition, citing the car industry as a negative example of competition. "I don't think the computer industry is going to profit from this," he said.

The survey indicated that users are split equally on the question of the need for competition.

"Half the people in the business produce junk," Green stated, adding he wouldn't want to see any more competition unless it were "quality stuff."

Hartman agreed that quality is the only area for competition since "we've probably seen as much cost reduction as the market will bear."

Others felt the industry needs all the competition possible. "It's good for everybody," said Gordon Smith, assistant vice-president, operations, First National Bank & Trust, Tulsa, Okla. "And it's good for IBM, too," he added.

Hang onto Leases

None of the users surveyed was anxious to take advantage of the opportunity to break his lease, largely because of the quality of service and equipment received.

Some, such as Richard G. Arehart, stated they had no reason to terminate leases at the moment, and were "waiting for others to set a precedent."

"We would like to be able to get out of an agreement if IBM or someone else comes up with a technologically superior product," said Dan E. Croft, DP methods and standards director, Jantzen, Inc. "Our main concern is the service function," he said, "and that's where IBM has got them all beat."

One user, who did not wish to be identified, said he would not return his new units, but "may think in terms of third-party leasing eventually. If that would look feasible, I may get out of it before two years," he said, "but not otherwise."

Quality Decision

Will the decision make independent peripherals more attractive to users? Most of the users felt the decision would benefit the peripheral manufacturers, but indicated quality and performance would still be the deciding factor in new acquisitions.

"If the service problems can be solved, I'll be more interested in independents in the future," Arehart said.

Another vote for the independents came from Bob Steinmetz, programming supervisor, State Auto Mutual Insurance, Columbus, Ohio.

"Personally," he said, "I'm coming to the conclusion that these independent vendors – the equipment they put out – are comparable to IBM and a hell of a lot cheaper."

But, Richard Green noted, the independents might be attractive to some shops for a while, but not in the long run – "IBM will clobber them with quality."

In addition to indicating a general trend toward sticking it out with IBM, the survey revealed a number of extraneous feelings.

"I really don't know what the decision is going to do," said David J. Vincent, DP operations manager, Associated Grocers of Colorado," but hopefully it won't set a precedent for everyone to go in and sue IBM, and hopefully it won't make Telex feel all-powerful."

"The thing that impressed me most was the settlement awarded to IBM," said Paul Neal, assistant vice-president, Educator and Executive Insurers, Columbus, Ohio. "The implications (i.e., the ban on hiring ex-IBMers) there were more stringent," he said.

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IBM Won't Collect Lease Penalty Payments

(Continued from Page 1)

clear how the judge arrived at the actual damages of $117.5 million."

Actually, the judgment was based to some extent on internal IBM documents, according to Judge A. Sherman Christensen.

There is "little room to question that the acts, conduct and intent" of IBM "caused substantial impact and damage to the business" of Telex, Christensen said.

But "as to any specific amounts of damages awardable in this case the evidence is less clear, and as justification for the sums asked for, quite unsatisfactory and insufficient," he added.

Telex, he noted, relied on forecasts to come up with its figure of damages, but he said these forecasts might be unreliable.

"IBM's internal documents indicated that IBM calculated its increased profits that would result from adoption of the Fixed Term Plan leases for tapes, disks and printers to be $466 million.

"Using the latter assumption and considering that in 1970 Telex was installing approximately 53% of the non-IBM manufactured compatible tape drives, 31% of such disk drives and 100% of such plug-compatible impact printers, a calculated loss of market share from FTP would be $218.7 million," the judge noted.

However, the judge thought IBM's calculations might be overstated and after applying a test of reasonability, he awarded Telex $70 million for loss of market caused by IBM's predatory actions. Telex had originally requested $257.7 million for loss due to deprivation of market share.

Telex was granted another $39 million which was the difference between what it would have made if it had not been forced to reduce rental prices on units already installed in response to the IBM actions, and the prices it actually received because of such reductions. Telex had asked for $92.3 million due to lost rental profits.

The judge placed lost sale profits at $8.5 million, after reducing the Telex request from $11.3 million because of factors that were not directly related to the IBM price cuts and other predatory acts.

In total, therefore, the damages were placed at $117.5 million which is "a fair and reasonable approximation based on the evidence before the court," Christensen said. The $117.5 in actual damages is automatically tripled in suits under the Sherman Antitrust Act for a total of $352.5 million in this case.

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IBM Overreacts?

TULSA, Okla. – During his testimony in the Telex-IBM case, IBM Chairman Frank T. Cary told the court IBM had to react to competition or it would be forced out of the peripherals marketplace.

However, Judge A. Sherman Christensen found this somewhat of an overstatement.

Cary's claim that "we obviously had to reduce our prices on [tapes and disks] or go out of business" is, "aside from its character of confession and only attempted avoidance," overstated factually, the judge said.

"IBM's plug-compatible competition in the disk and tape area did not threaten to drive IBM out of the business in those markets," he said, noting IBM itself predicted it would lose only 28.7% of those markets if it did not react to competition.

Trucks Keep on Trucking

AUSTIN, Texas – No longer must trucks stop or even slow down in order to be weighed at designated turnoffs along the highways of a number of southern states.

Thanks to a computer system mounted in a small truck, crews of men who used to flag down trucks at prepared turnoffs and weigh them are no longer necessary to help highway planners determine which type of paving material would be best for certain roads.

The Weigh-In-Motion (WIM-1) system, manufactured by Unitech, Inc., includes a Nova 1200 computer, teletypewriter, line printer, visual display and a magnetic tape unit. The equipment at the site includes strain gauge wheel load transducers, a speed trap and vehicle presence detector. The small van containing the computer parks beside the roadway and plugs into the sensors, and an operator sets a minimum threshold weight that excludes measuring smaller vehicles.

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State OKs Teale Talks

SACRAMENTO, Calif. – The state's frustrating effort to find a vendor for the Stephen P. Teale consolidated computer center has taken a new twist with the legislature now authorizing negotiations instead of competitive bidding.

The legislature passed a law on the eve of its adjournment, which, if signed by the governor, will allow the Business and Transportation Agency to negotiate the contract for the initial implementation of the center.

The contract for the center is expected to be about $40 million.

A spokesman for the state EDP office said the agency will negotiate with anyone, but vendors will have to make themselves known by Oct. 15.

An award will be made before the first of the year, he said.

The state tried twice without success to award the bid competitively. The first time the two bid finalists were disqualified. The second time there was only one bid – by IBM – and a law had required bids with at least two different mainframes.

IBM's Mini Close

NEWTON, Mass. – The anticipated IBM minicomputer will probably be called the System/2 and will reportedly be manufactured in Japan and exported to other IBM markets. Tentative price for a typical system configuration is said to be about $1,000/mo. Announcement date has been set "very soon" by IBM, industry sources believe.

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The Definition

Plug-Compatible Market 'Separate'

TULSA, Okla. – Perhaps more than any other antitrust case in modern history, the IBM-Telex case hinged largely on the market definition issue: the question of whether the independent plug-compatible market could be separated from the larger market for EDP equipment or services.

Judge A. Sherman Christensen, relying by and large on the "reality" of the computer market,

"To treat defendant's peripheral products as immune from separate market consideration in view of the competition focused upon them would recognize an immunity in favor of IBM from the operation of the antitrust laws."

clearly found the independent plug-compatible market a separate market.

In this case, he said, "We are not dealing with mere theory but with a historic, economic fact, transitory or otherwise."

The real issue in the case, he said, "is whether that [overall EDP] market may be realistically subdivided in the time frame 1969-1972 to focus on and encompass only those parts of current product lines which are respectively attached to IBM systems."

The evidence in the case, he said, "shows that peripheral devices attached to IBM equipment but manufactured or supplied by others during the relevant period have grown into, and have been recognized as, a significant, distinct and important part of the EDP industry."

However, he noted, " . . . in this extraordinary industry dominated as it has been by IBM's influence, neither theoretical relationships nor technological similarities supply the full answer to the relevant market problem.

Antitrust Test

In judging antitrust cases, three important factors must be considered – a definition of the relevant market; determination of whether or not the defendant had market power or control in that area; and, finally, an investigation of the defendant's practices in that market.

The three articles on this page probe the judge's findings in each of these areas.

"In the realities of the marketplace, as recognized and acted upon by IBM as well as by the plaintiffs and its customers, it must be determined" whether there is a separate submarket for peripheral equipment compatible with IBM systems.

Judge A. Sherman Christensen found IBM peripherals did not compete with the peripherals of other systems makers because in order for a user to use those other peripherals "the user must first replace his IBM central processing unit.

"The only box-for-box peripheral competition of any substantiality has been and is between IBM and the plug-compatible manufacturers," he said.

"Practical considerations," he said, "militate" against the IBM argument that it should be judged only in respect to the overall EDP market.

First, he said, IBM's market definition would permit IBM to adopt a "divide and conquer strategy of monopoly," and secondly, he indicated, "in the realities of the market and of competitive conduct, neither IBM, its competitors nor the public have experienced difficulty in subdividing the EDP industry into markets roughly equivalent" to those claimed by Telex.

"Practical considerations militate" against the IBM argument that it should be judged only in respect to the overall EDP market.

IBM, in all of its internal studies and projections, treated the plug-compatible peripherals market as a separate entity, he said, and in fact aimed most of its predatory practices at that industry.

The "critical flaw" in the IBM theory is that it would ignore "the separate market and submarkets within which IBM waged its predatory competitive battles and which became and were thereby made separate competitive entities in the marketplace and within which monopoly power existed and was exercised."

The IBM theory of "interchangeability of use," – that is, that there were substitutes for its products – is more theory than reality, Christensen ruled,

(Continued on Page 8)

The Power

IBM Does Have Dominance in the Market

TULSA, Okla. – After determining the relevant market against which to judge a defendant, the judge in an antitrust case must then decide whether the defendant has the power to dominate that market.

Having found the independent peripherals market a valid subdivision of the overall EDP equipment and services market, the judge went on to find IBM in fact dominated this section of the business.

"Monopoly power is the economic ability to charge unreasonably high prices and to exclude competition," he noted in his decision.

IBM Document Evidence

While there is some general information available on IBM's market share in this area, the judge found even more evidence available from the IBM files introduced in the case.

IBM, "in the processing of its marketing strategy and planning, developed an organization and system well-designed to segregate these data," he noted.

"Accordingly, while the court has considered the general data available . . . it has seemed fair and appropriate to afford considerable weight to the data available from the defendant's studies, and it has," he said.

These market shares, and other evidence introduced into the case, "support a finding that IBM's share of the relevant submarkets of the combined submarkets comprehended in the general market classification, 'peripheral equipment plug-compatible to IBM,' is such as to permit an inference of monopoly power on the part of IBM . . ."

The judge noted that "IBM's internal documents, generated in connection with competitive studies looking toward management decisions to meet the competition of plug-compatible manufacturers, have been deprecatingly referred to in argument by the defendant as being the products of non-management employees, or as grossly underestimating competition."

But, he said, "It seems appropriate to note here, however, and for later reference in connection with the predatory conduct of IBM, that most of the studies were made by highly trained and qualified IBM personnel acting within an organization justly noted for its perception and responsiveness to market conditions, and with technological standards and aids likely superior to most great companies of the U.S."

The "rather consistent acceptance" of these documents by IBM's top management, he said, "indicated to me, by and large in view of all the circumstantial evidence in the case, that IBM's internal documents represent significant evidence not only as to market shares but as to the intent and purpose of the defendant."

Because of these documents, the court found that "monopoly power during all periods material herein was possessed and exercised by the defendant IBM."

These market shares, and other evidence introduced into the case, "support a finding that IBM's share of the relevant submarkets of the combined submarkets comprehended in the general market classification 'peripheral equipment plug-compatible to IBM,' is such as to permit an inference of monopoly power on the part of IBM, and the court so finds," he concluded.

The Practice

IBM Tried to Kill Competition

TULSA, Okla. – Not only does IBM have substantial power in the market for plug-compatible peripheral equipment, but it also used that power in an "attempt to substantially constrain or destroy its plug-compatible peripheral competition by predatory pricing actions and by market strategy," according to Judge A. Sherman Christensen.

Christensen, in his opinion on the IBM-Telex case, noted that in 1970 IBM itself clearly recognized the equipment offered by its plug-compatible competition was "functionally superior to" the IBM equipment it was designed to replace.

Task Force Formed

In response to this competition, the firm, he noted, established a task force to "study and recommend plans and product strategies to impede the growth of IBM's plug-compatible competition."

The task force, he said, "made in-depth analyses of various plans and strategies each having as a significant purpose the containment and retardation of the growth" of competition.

The first concrete result of this study was the Mallard project, he noted, or the 2319A disk drive and integrated file adapter for the 145 which was priced by IBM "to have maximum impact on IBM's plug-compatible competitors . . . IBM's price cuts . . . were not justified upon the basis of reduced manufacturing costs," he added.

(Continued on Page 8)

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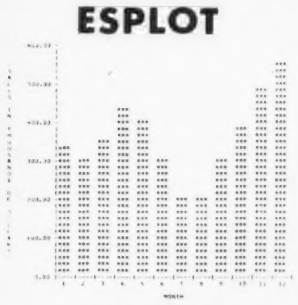

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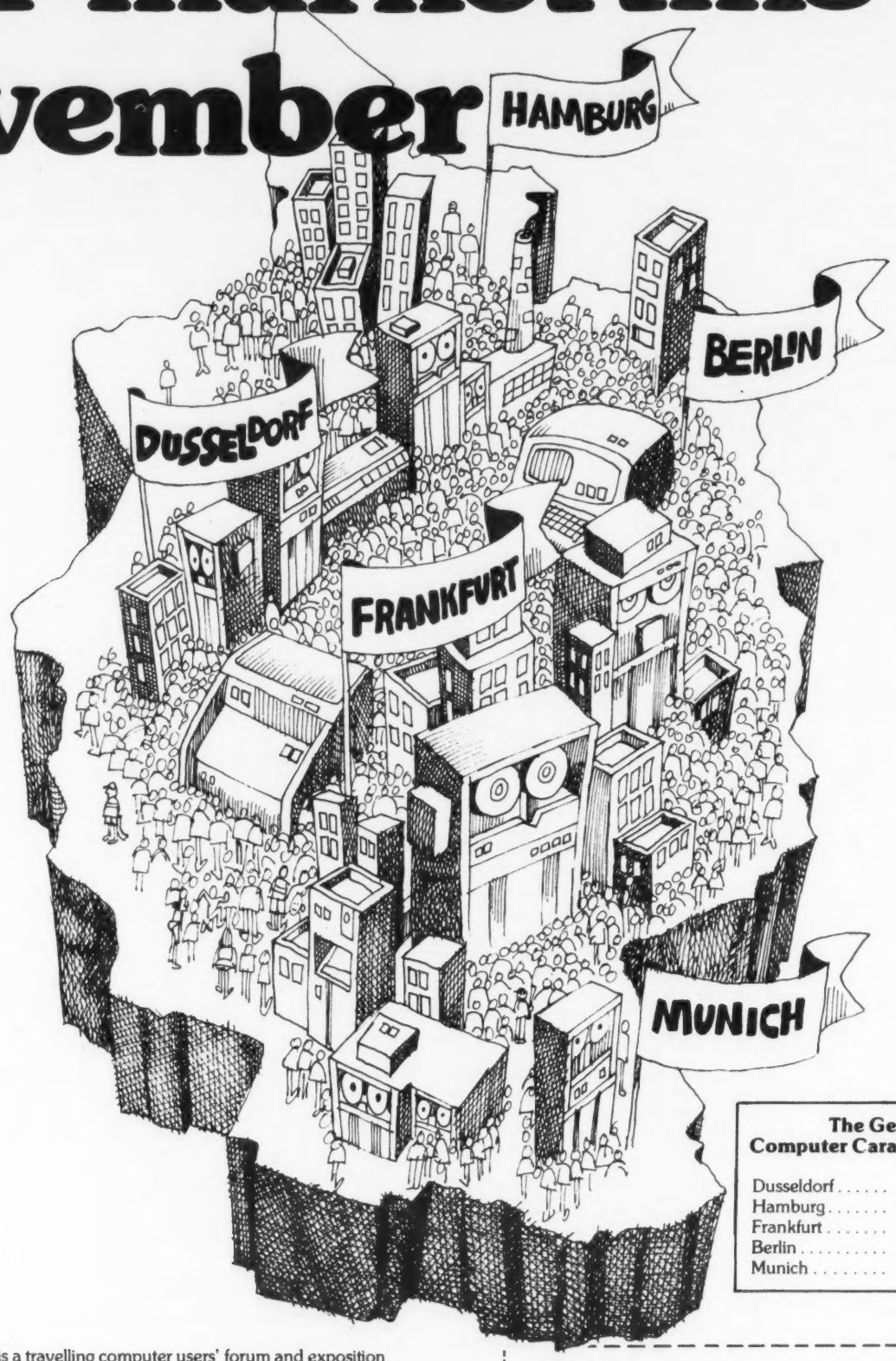

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IBM Attempted to 'Destroy' Competition

(Continued from Page 8)

In addition, he said, the "price reduction independent of cost on limited products in competition with plug-compatible suppliers was the primary purpose of the response."

At the same time, he said, "IBM camouflaged the 2319A price cut as a 'new' product for the purpose of avoiding a general price reduction to all its installed 2314 subsystems which would have reduced IBM's revenue stream of $514 million a year on its installed disk base by approximately $120 million per year."

There is no doubt, he said, "The 2319A price cut was designed by IBM specifically to contain the plug-compatible competition . . . Its primary purpose was to maintain control of the plug-compatible disk market for IBM. It was introduced by IBM with the specific purpose and intent of suppressing plug-compatible competition."

Ordinary Response?

At the same time, he noted, "IBM admits, indeed argues,"

All of the IBM practices during the time under consideration "have included an attempt to substantially constrain or destroy its plug-compatible peripheral competition by predatory pricing actions and by market strategy bearing no relationship to technological skill, industry, appropriate foresight or customer benefit."

the move was a response to competition, but added "its intent to maintain its monopoly by unlawful predatory conduct cannot be equated reasonably with an ordinary competitive response."

However, the 2319A announcement didn't have fully the desired effect, so IBM established another task force to see how to better meet the competition, and this group said IBM should further cut the prices in this area to produce "a very serious impact" on the profits of both Memorex and Telex, the judge said.

To do this, IBM offered the 2319 to the 360 System with the 2319B announcement – which was a substantial price cut over the prices for the identical 2314 disk drives.

"The 2319B announcement was purely a price cut," the judge found. "The 2319B was designed by IBM as a predatory action contrived to maintain its 94% control of the plug-compatible disk market," he added.

Long-Term Leases

"There seems little question but that in a different context, or directed to general competition, the leasing plans adopted by IBM might be unexceptional or entirely justified," Christensen said.

However, in the light of the

(Continued on Page 9)

Market Called Separate

(Continued from Page 8)

since for every product there is some substitute, but in the reality of the marketplace computer users compared disks against disks, tapes against tapes, etc.

The IBM theory of "supply substitutability," – i.e., IBM felt constrained in its pricing policies because if it priced too high others would enter the business – took even a harder blow.

"Manufacturers who have existing technological capabilities or tooling to supply reasonably interchangeable products may effectively restrain the power of those in the market to raise prices," Christensen admitted.

"But," he said, "the evaluation of whether this is so again is dependent not upon mere theory but upon the reality, if any, of the effect of the potential in the marketplace.

"A relevant market cannot be enlarged by theoretical speculation as to future market conditions of potential substitutability having no substantial effect upon competition during a period in question."

Accepting the IBM view of the computer market, Christensen said, "would be designed to render Section 2 of the Sherman Act relatively innocuous and ineffective and would permit the defendant with impunity to continue to monopolize and attempt to monopolize a relevant market and submarkets one by one by unilateral predatory actions until the entire industry could be irreparably demoralized.

"It would be a gross, sweeping and invalid generalization to say, as IBM contends, that it "is engaged in the manufacture, sale and lease of data processing systems," Christensen added.

"To treat defendant's peripheral products as immune from separate market consideration in view of the competition focused upon them would recognize an immunity in favor of IBM from the operation of the antitrust laws," he added.

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IBM Management Aimed to Destroy

(Continued from Page 8)

reality of the market, he found IBM was aiming those moves also at the plug-compatible competition alone.

Most of the planning for the long-term leases was measured "in terms of the impact that IBM action would have on IBM's plug-compatible competition," he noted.

The internal IBM projections show IBM would sustain some losses in revenues in the first few years of the programs, he said, but in IBM "it was thought that FTP would be very profitable in the long run because losses from plug-compatible competition would be decreased and it would have more units out in the field for longer periods of time."

All of the benefits anticipated by IBM from this plan "revolved around the suppression of IBM's plug-compatible competition," he noted.

While IBM claims it only adopted the plans to be more competitive, Christensen said there is a "rather clear indication that its action was directed not at competition in an appropriate competitive sense but at competitors and their viability as such."

The evidence, he said, "demonstrates that IBM's fixed-term plan was generated and implemented at the time it was with the primary intent and purpose of suppressing plug-compatible competition and to maintain its monopoly power."

All of the IBM practices during the time under consideration "have included an attempt to substantially constrain or destroy its plug-compatible peripheral competition by predatory pricing actions and by market strategy bearing no relationship to technological skill, industry, appropriate foresight or customer benefit," the judge found.

"But we find unconvincing the idea that separate markets or submarkets actually recognized by IBM itself in this dynamic and amazing industry could not have been developed eventually from IBM's prior lawful domination of it; or that the objectives and planning of such a presently dominating force against the competition of the peripherals could somehow be deemed dissipated among lower echelons of this great organization and not considered to be reflected in the competitive actions of top management, or that if reflected, should be held innocuous or futile, or at all events lawful, as competitive weapons," Christensen concluded.

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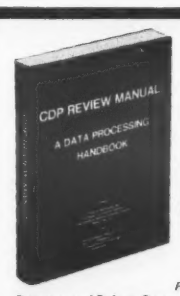

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Editorial

An End to Domination?

The computer community – both users and the industry – is certain to benefit from Judge A. Sherman Christensen's ruling last week in the IBM-Telex case.

Christensen's scholarly findings in the case – if upheld on appeal – will serve to broaden competition in this previously dominated industry – and that competition will broaden the range of choices available to computer users as well as enable smaller firms in the business to prosper.

Computer users should hail the decision since it will eventually break what Christensen clearly saw as IBM's subtle domination of the computer industry – a domination he called dangerous.

This does not mean IBM will be forced out of the business or have to limit its role in the field. Instead, the decision just prohibits IBM from unfair marketing practices that are detrimental to the entire computer community.

Users will still be able to get their entire systems from IBM, if they so chose. But the range of choices will be more varied.

The products from the independent peripherals industry could also be better than in the past since the independents will be given all the specifications for planned IBM announcements in advance, thus allowing them time to design their devices to meet those specifications.

This lead time will allow them to bring their products to the market at the same time as IBM, thus giving the user a range of choices from the first day of a product's life, instead of having to wait years before choices are available.

A sweeping section of Christensen's ruling also prohibits IBM from predatory acts in general, which should give those users who have complained about some IBM practices in the past a more solid footing upon which to make their objections heard.

The decision against Telex on the counterclaim is also good for the industry, because industrial espionage has gone unchecked too long in the highly competitive independent peripherals market.

In all, we completely agree with Christensen in his summation of the case:

" . . . under the facts and the law of the case it has been concluded that plaintiff's (Telex's) complaint has required vindication in the manner provided above in justice to them and in aid of proper competition; that defendant's counterclaims similarly have required vindication in justice to it and in discouragement of improper competition."

Consider Emulation Temporary

By Rex Kerley
Special to Computerworld

The following is a Burroughs rebuttal to an Aug. 22 Computerworld *editorial entitled "The Horrors of Emulation."*

Emulation should be considered in terms of practical reality, not in an academic environment. Formerly, emulation was considered merely a temporary procedure, to be used only for a short period of time (say six months), until the original programs for the replaced computer could be reprogrammed for the new computer. It was discovered, however, that such reprogramming was not always performed. Pertinent reasons include:

- No copy of original source (i.e., completely missing or lost/stolen/strayed).
- Original source incomplete (due to object-level patching without updating of symbolic source).
- No documentation of original program as to its exact purpose, specification or implementation.
- Original programmer no longer available (e.g., left the company).
- Takes too much time, so there might be an interim period with no facilities to run old programs, or no working and tested programs to run on new computer.
- Too expensive (e.g., several man-months of programming and testing).
- Technically infeasible (i.e., application is not suitable for rewriting).

In reality, therefore, the motivation for reprogramming. as contrasted to emulation, is mainly of a financial nature, rather than pedantic "ivory-tower" axioms. Thus, from a practical viewpoint it may be advisable to continue emulating an old program on new hardware indefinitely.

We advocate no such plan at Burroughs. Our users (whom we believe to be intelligent users) should consider emulation as a temporary holding action pending some type of rework or updating of their computer application.

We realize the word emulation has been given a bad name by other vendors due to a variety of factors. The principle is that emulation has been an "add on" hardware "black box" type of process that has resulted in a less than satisfactory product to the computing community.

The Burroughs B1700 takes emulation in its stride as a natural product of this bit-addressable, variable microprogrammable computer. The concept of digits, bytes or words to this computer is so artificial that it ceases to be a problem. ("Design of the B1700" by Dr. W.T. Wilner, Afips FJCC 1972 Vol. I, pp. 489-497.) So again, in this subject, as with others, Burroughs dares to differ.

Would you criticize a manufacturer of movie projectors in having the ability to show the older 8mm movies in addition to showing the super 8mm size? The versatility of the B1700 design is providing our ever-growing user base with a painless way of utilizing present systems and yet having important options to upgrade those same systems at a time suitable to the user.

Rex Kerley is project leader in the Firmware Section, Software Systems Management Department, Santa Barbara Plant, Burroughs Corp.

Letters to the Editor

VS and CPU Usage

The July 25 issue of *Computerworld* contained a very interesting report on the value of tuning VS systems. There was one item, however, that might unintentionally have misled readers. The study suggests a tuned system uses more CPU than an untuned one. For example, (after partial tuning) "the plain old VS system that we started with dropped the execution time to 56 minutes and the CPU utilization to 85%.

"Another test, bringing together both tuning efforts, caused execution time of the 13 jobs to drop 51 minutes, but the CPU utilization crept up to 88% again."

However, percentages here are misleading. At an 85% utilization rate for 56 minutes, 47.6 minutes of CPU are used. In effect, the tuning effort has compressed the net elapsed time for the stream by better distributing demands on system resources. The absolute reduction in CPU time of about 6%, from 47.6 minutes to 44.9 minutes in a VS environment, is probably caused by reduced paging and CPU translation in the VS system.

The only apparently surprising result is the figure of 88% utilization for 60 minutes on a tuned VS but with untuned jobs. However, the figure for untuned jobs and untuned VS is not given and would normally be the standard of comparison for success in tuning VS.

Users should be aware, however, that other things being equal CPU usage will go up on a VS system because of paging overhead. As the article clearly shows, though, the increase in throughput makes this worthwhile.

David E.Y. Sarna
System Engineer
IBM Israel Ltd.
Tel Aviv, Israel

'Pacific Was First'

Re the Aug. 29 article titled, "Coin, 155s Track 50,000 Freight Cars":

Pacific was the first railroad to implement an on-line computer system using IBM's Tcam software package. This point was completely missed.

Also, the first paragraph implies that Union Pacific operates "thousands of trains per day" – an embarrassingly gross overstatement of fact.

A later sentence states: "The network includes 178 multi-drop AT&T lines in the East in addition to the microwave segment owned by the railroad," while the system consists of 178 lines in total.

J.L. Jorgensen
Union Pacific Railroad Co.
Omaha, Neb.

Professional Practices

All-Inclusive Contracts Considered Good Practice

By J. Richard Fleming
Special to Computerworld

As a result of increased concern about the shoddy "standard" agreements put forth by computer companies, our organization has begun to incorporate a 12-point "Turnkey Agreement Framework" in requests for proposals submitted by our clients to computer companies.

Point three of the Framework, for instance, requests the computer company to agree to include a statement incorporating all documents and communications, such as system specifications, proposals and oral representations into its final contract.

This is done because as a management consultant specializing in the field of information systems and computer technology, I am extensively involved with small-to medium-size companies in their contractual relationships with numerous computer equipment or service companies. I have observed, first-hand, a number of situations similar to Angler-Honeywell, which Alan Taylor recently characterized as a "Bait-and-Wait" arrangement.

(In fact, my firm is presently withholding its recommendation of a well-known computer company until we receive proper assurances from the chairman of the board that his company will act more responsibly in fulfilling its obligations to our clients. We have not yet had the courtesy of a reply in the three months that have passed since we brought two specific client situations to his personal attention.)

We do not believe that the "Bait-and-Wait" approach is the planned policy of any reputable computer company. We do feel strongly, however, that the source of the problem is the "good faith" umbrella-type of agreement marked so expertly by IBM, and which has been emulated by most others in the industry.

Unfortunately for many smaller companies involved with the first computer installation of their "turnkey" systems, "good faith" agreements get strained – and sometimes are broken.

It is at this point, when both the user and computer company have a substantial investment in the effort, that we find more and more computer companies retreating to a defensive legal position in order to forestall potential damage suits. This is accomplished by concurrent actions in:

- Increasing the level of visible support activities to get the equipment installed as quickly as possible. Equipment represents the tangible part of "good faith" agreements.
- Redefining the more technical aspects of "The Contract" as narrowly as possible. These technical terms are rarely spelled out in the original agreement. The user is severely handicapped technically and legally, unless he has some unusual amount of leverage or expertise.

In short, we find "Bait-and-Wait" occurs most frequently after a major problem has surfaced. The best way for a computer company to protect its investment is to push on with the installation while taking steps to limit its potential liability.

Because of these possibilities, we find we have to make our request for agreement to our standard terms non-negotiable. Indeed, if a computer company will not agree to the reasonable contract conditions, its proposal is not given further consideration.

(J. Richard Fleming is the president of Systems Planning Associations, Inc. in Westfield, N.J.)

Letters to the Editor

Change in Disk Drives Key to DOS/VS

Re "DOS/VS . . . How Good Is It? [CW, Aug. 22]:

I was appalled to find that in one of two lead articles on virtual DOS compared with resident DOS a test site reporting improved performance with virtual DOS had changed from eight 2314 disks to (presumably eight) 3330s.

This site (Armstrong Cork) reported its workweek had been cut from six to five days; and its computer manager had a number of intelligent comments to make about the performance of DOS/VS. The article was well-written, on the whole, and quite informative.

But to draw any conclusions about the comparative performance of DOS/VS – impossible! I would wager that the change from 2314s to 3330s alone, under "old" DOS, would have produced all of the "improvements" and possibly more (no time being wasted on address translation or paging).

Further, this installation may have added core as well – I could not tell from the article whether "real" core had been increased from 256K to 384K. This should again have affected performance, though not as much, I would think, as the change in disk drives.

William Lee Valentine
New Orleans, La.

Charles Letteer, the DP manager, recognized that each of the changes made by Armstrong Cork affected – probably positively – the operation, but, as reported, his systems staff had not had time to run benchmarks against each change to document its effect. Armstrong went, incidentally, from eight 2314s to only six 3330 spindles.

Also, while Armstrong was a test site in IBM's eyes, Letteer was really *using* (and not specifically *testing*) the VS operating system. His overall impression, based on all the changes, was that DOS/VS "worked" for Armstrong. Ed.

Put Technicians In the Limelight!

CW's front page article regarding system's and data processing's need to "think like managers" [CW, Sept. 5] made me see red!

It's all part of the same old refrain: we are not managers, we are technicians; we are not salesmen, we are technicians; we are not communicators, we are technicians.

When people like John L. Jones (vice-president, Southern Railway) and Robert C. Mizell Jr. (Trust Co. of Georgia), and many other top execs, continue to chide us for not being management-oriented, or for not involving top management, they are talking out of both sides of their mouths.

These same executive mentalities keep us technicians out of sight, out of mind, by tucking us away under the aegis of the non-dedicated-to-DP organizations.

We just might be able to learn to think like managers if we could get some top management exposure through an appropriate reporting level, instead of being tied to some internal department.

These critics of our management abilities should heed the dogma of their very own American Management Association: *you can delegate authority, but not responsibility.* Or conversely, don't hold responsible those from whom you have withheld authority.

Name Withheld
Upon Request
San Jose, Calif.

CW believes that information processing in most companies definitely warrants an organizational level equal to marketing or manufacturing. The problem is to get past the beancounters. Ed.

'Get Job Done'

"Amen" to what John L. Jones said in the Sept. 5 issue! I have been preaching for years to "get the job done!" Management feels that long drawn-out studies should be made following guidelines set down by "unnamed" consulting firms.

The result is the rules of the game change, the user is frustrated waiting and no one is happy. By the time a year or more study is complete the system could be up and running.

Modular structure will enable changes to be made much more easily than the "it will take a few months to redo."

It seems Southern Railway knows the way!

Edwin Seidman
Calcomp
Rosemont, Ill.

Those TSO Terminals

In the article on "Terminals Compatible With TSO Include Teleprinters and CRTs" in the Aug. 27 issue, Ken Seidel openly admitted limited exposure and that "judgments are subjective and limited to those terminals actually available at a particular user's site." But by virtue of the fact that a leading EDP industry publication published this article, Seidel is an "expert" on this subject whether or not he feels this way.

Many readers are likely to read this article in a less critical manner than someone in the terminal business, and the net result is that a large percentage of the readers, I am sure, will walk away with the impression that there are only five TSO terminals, when in fact there are considerably more. An exact number is difficult to ascertain, but a conservative estimate is 25.

If Seidel should write again for *Computerworld* (and I hope he does), he should be more exhaustive in his analysis. Certainly, it would take an unreasonable amount of time to search out every TSO-compatible terminal but, one must agree, five is cutting it a little short.

William F. Tilley
Director of Marketing
Computer Devices, Inc.
Burlington, Mass.

There may indeed be more than 25 TSO-compatible terminals. Seidel's article would be most useful for people who had either reduced their selection to those particular terminals he studied for the Aug. 27 article, or who were looking for various characteristics found in "typical" TSO terminals. Ed.

Who Is That Man?

I have just finished reading the "Taylor Report" of Aug. 15, entitled "Symbols of Information Quality." I have long considered his column of questionable value, but this time I feel compelled to write and express my sentiments.

If Taylor continues to produce "garbage" of this type, I suggest he be given a long vacation and his allocated space given over to a white area so we can make notes regarding other meaningful and interesting topics found elsewhere in the paper. That is unless the rumor I've heard is true – that Taylor is the brother-in-law of some important *Computerworld* executive.

Muneo Goto
Tokyo, Japan

We hear jazzier rumors about Alan than that one almost every week. HG.

From Alan Taylor's Mailbag

Clerks and Firms Are at Fault, but Not the Computer

The Taylor Report
By
Alan Taylor, CDP

In Alan Taylor's Mailbag on Aug. 22, Richard M. Mendes reported he had been repeatedly promised that Bankamericard would change his billing date (which was personally inconvenient), but then failed to do so – apparently because the billing date had been built into the account number.

This raised two professional questions:

- ATMB 1: "What is the responsibility of a firm whose employees promise some action that does not then take place?" "Should such conduct be punished?"
- ATMB 2: "Is the practice of including billing dates in account numbers all right?"

Here are some of the responses:

A billing date, as such, is not built into the account number. All accounts are assigned to a cycle. The cycle number determines the relative billing date.

In response to Mendes' request, the clerk should issue one transaction which would:

- Establish an account in a cycle with a billing date to suit the customer needs.
- Issue a new plastic card.
- Transfer the old balance to the new account.
- Transfer any charges which might come in under the old account number to the new account.
- Close out the old account.

Mendes' complaint is misdirected. Neither the Bankamericard computer or system is at fault. His frustrating experience was caused by clerical error and can be corrected through proper training and supervision of customer service representatives.

C. Robinson
Senior Systems Analyst
Lake Success, N.Y.

Writing Most Valid Way

Without a written communication, how could a customer *prove* an employee promised anything? I know the frustration Mendes feels. (What consumer doesn't?) When calling a company for any reason, the customer is well-advised to get the name of the employee with whom he is talking and, if the matter is serious enough to so warrant, write a letter reviewing the discussion and promises made and send it to the company as a follow-up.

In addition, the employee should be requested to send a letter, memo, etc. to

(Continued on Page 12)

Clerks and Firms Are at Fault, but Not the Computer

(Continued from Page 11)

the customer as confirmation of the discussion and to ensure complete understanding of the problem.

Robert B. Dickson
Manager, Data Processing
Fullerton, Calif.

Getting Some Air

Plaudits for initiating Taylor's Mailbag. It will perform a much needed service. Although there may be some excellent ombudsman programs in operation, they lack the one ingredient which only someone like Alan Taylor can supply – the open-air forum of the press.

Regarding ATMB/1:

• Employees who *promise* action on a complaint or inequity in a billing system are acting as representatives of their organization. The organization should therefore be fully responsible to initiate the promised action.

• A liquidated damages clause ($100 for each billing cycle, for instance), as suggested in Taylor's comments would be most effective, I'm sure. Nothing gets faster action than a potential reduction of profit. (I can see the systems people and programmers scrambling to make necessary changes to the system).

• Unfortunately, the liquidated damages scheme could run afoul of a rather simple change in procedures at Bankamericard (or any other organization). The damages must be linked to the misleading of customers.

By simply spelling out the billing scheme in the original agreement between credit card company and customer, the company avoids having to contend with damage suits and avoids having to make expensive systems and program alterations to inadequately conceived systems.

Ron Stewart
DP Organizational Consultant
Chicago, Ill.

Dates and Numbers

Regarding the second question – the point about whether billing dates should be included in account numbers – here are two responses:

Ten years ago, I did the programming for a tape-oriented 1401 system for installment credit accounting – fixed contract, not revolving charge.

In the design specs for this system the billing date was both a low-order part of the record key *and* a standardly changeable item. Since contract numbering had not been thoroughly controlled, many accounts differed from each other *only* in the billing date field. This meant that a change in billing date sometimes caused an account-key to leapfrog adjacent keys and create an out-of-sequence condition – sometimes including a duplicate-key condition.

Robert Higgins
West Chester, Pa.

AT comments: Sounds like a bad case of Nokefenoky (Not OK if Not OK) to me.

Should Kodak Use Blue Box?

I don't know how Bankamericard assigns numbers, whether it's alphanumeric, by territory, bank of deposit, class of account or whatever. But the chances are there is some very good control reason. Many firms use an alphanumeric system with automatic assignment of number by alphabet, which automatically keeps the cycles at approximately the same size.

In any case, why should Bankamericard change a system serving several hundred thousand for the whim of an individual? It makes about as much sense as insisting that Kodak use a blue box for its film because (Mendes) doesn't like yellow. Bankamericard has a sound program, and if Mendes doesn't like it, why doesn't he just close his account?

• ATMB/3: Regarding the "billing date," it is merely the day on which statements are closed. There is nothing mysterious about the fact that it then takes a few days to enter the final day's transactions, to balance the cycle, pull out the one-cent balances, make last-minute address changes, combine certain accounts, insert in envelopes, add postage, sort by Zip Code and get to the post office.

V.T. Lorimer
Minneapolis, Minn.

AT comments: The words "billing date" do have meaning in the English language. That says nothing about statement closing date. Does the data processing profession have the right to alter the meanings of words? Please address any comments on this issue to Alan Taylor Mailbag, 633 Central St., Framingham, Mass. 01701, using reference ATMB/3.

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Insurance Fraud Ring Based on Fake IDs And Phantom Cars

By Marguerite Zientara
Of the CW Staff

PHILADELPHIA – An insurance fraud ring based on phantom cars is being cracked slowly with the aid of computers.

The fraud, in which 36 arrests have been made, involves inventing a registration number for a nonexistent car, reporting the car stolen and collecting insurance, authorities said.

The scheme, centered in Philadelphia, was disclosed by investigators from the Pennsylvania State Police, the FBI and insurance companies.

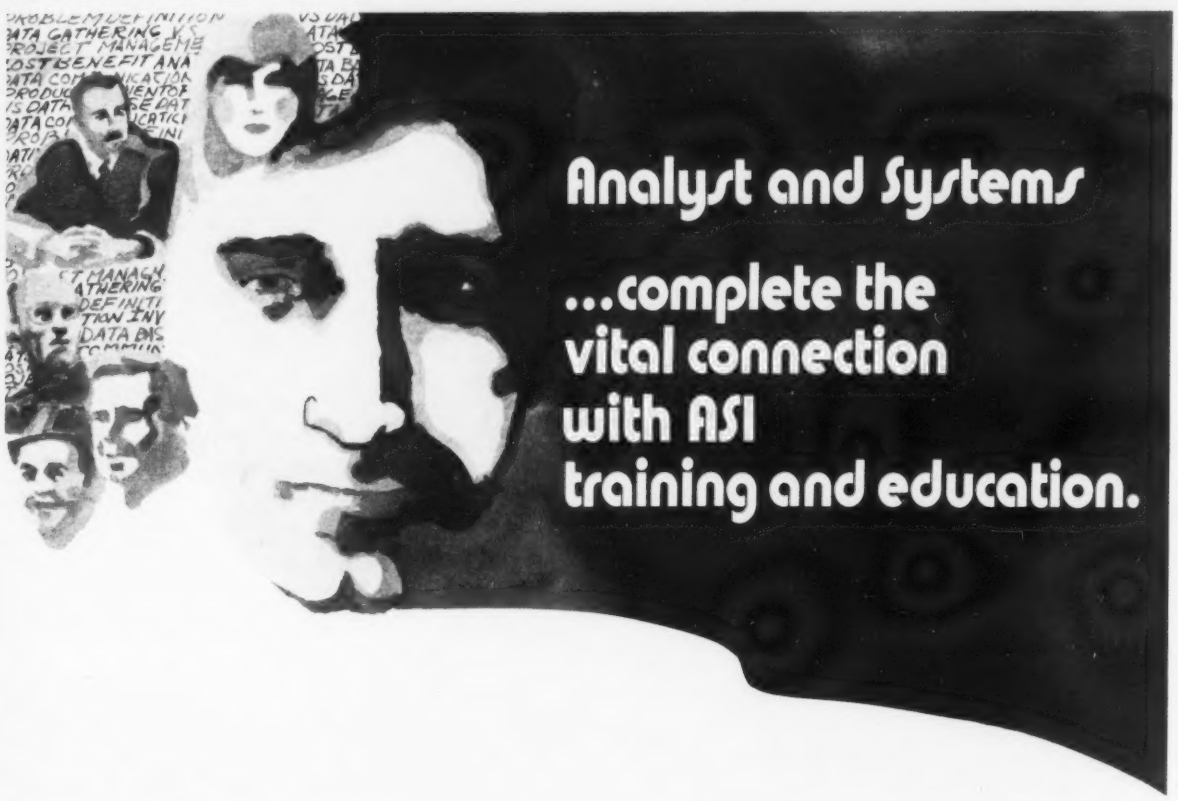
The operation began in 1969, authorities said, and involves 450 nonexistent General Motors cars and millions of dollars in claims unwittingly paid by 13 insurance companies.

In the State Motor Vehicle Bureau at Harrisburg, a computer checks the vehicle identification number on each auto title application to determine if such a number is already registered. If it is, the computer rejects the application.

Number Is Key

The number, which includes a coded description of the car and a 6-digit identifying number, is a key in making the fraud work, investigators said. "These people are smart enough so that they know the coded prefix," said a private investigator retained by one of the insurance companies.

A spokesman for the Department of Revenue said most cases of nonexistent cars are discovered when the Department of Revenue checks into the title histories of cars in "suspicious" situations. If a title history, which follows a car from the time it is manufactured to its arrival in any state, does not exist, then the car does not exist, according to the spokesman.



Of all the data processing areas of specialization, the systems analyst is the most unusual. The analyst is forced to be both a generalist *and* a specialist. He must be prepared to deal with not only other DP people, but also be competent to deal in the area of user needs as well. On the one hand, the need to keep current with the state of the art in data processing... and on the other, the need to know marketing, production, personnel, purchasing, financial and manufacturing systems.

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NCR
Terminals & Computers

Random Notes

Checks Can Be Safeguarded By English 'Translation'

CANOGA PARK, Calif. – Checks produced by IBM 360 programs written in Assembler or Cobol can be protected against fraudulent alteration by having the amount spelled out in English as well as in its normal numeric format. "Translation" of the numeric data stored in the computer can be handled by a 750-byte routine called JSCAMTAL, now available from Joseph Sider & Associates.

Maximum value that can converted to English is $99,999.99. The routine is activated through a simple CALL using parameters to identify a six-byte positive number, the location where the words will be formed and an indicator of the last permissible location in which the words may go. The routine may be ordered for $75 from 6701 Variel St., 90049.

Roscoe Adds Utility Subsystem

PRINCETON, N.J. – A utility subsystem added to Roscoe, the conversational remote programming system from Applied Data Research, Inc. (ADR), provides on-line OS/360/370 data set management to systems programmers. The functions available with the new feature are comparable to those provided by TSO and the batch utility programs from IBM, ADR said.

Working with a Roscoe terminal, a systems programmer can now allocate, catalog, rename, write and scratch data sets. He can also build, find and delete entries in the OS catalog. Roscoe sells for $18,000 or leases for $1,000/mo. ADR is at Route 206 Center, 08540.

Disk, Tape Conversion Offered

SANTA ANA, Calif. – IBM 360/370 users can convert data from conventional disk or tape files to microfilm or microfiche format with the Datacom software, now available from Business Systems Division of Pertec Corp., for use with the company's 3700 computer output microfilm (COM) system.

Parameter cards define formatting requirements including report page and film layouts. Datacom can also produce title and index microfiche directly from user files, eliminating post-processing steps often associated with COM, the company said from 17112 Armstrong, 92705.

Service Aids Piping Testers

KANSAS CITY, Mo. – Engineers planning piping systems can work through terminals to define a proposed configuration, test its effectiveness and enter changes before retesting, with the Autoflex analysis service now available on the United Computing Systems, Inc. remote-computing network based at 3130 Broadway, 64111.

'Survival' Handbook Tells How

Post-Installation Evaluation a Must

By Don Leavitt
Of the CW Staff

CAMBRIDGE, Mass. – Regardless of what system design and implementation plan are followed with a new application, the user can't be sure the effort is worthwhile unless he is willing to run a post-installation evaluation within a reasonable time after the application is in place and operational.

This rule-of-thumb applies, according to consultants Susan Wooldridge and Keith London, whether the system was developed and delivered on time and within budget, or late and at much greater cost than originally expected. Only by looking back after the work is done can users see specifically what went right or wrong with a project.

In their recently published *Computer Survival Handbook* (Gambit Press), the English authors noted the amount of time which elapses between the start of live running and the formal evaluation depends on several factors. The most important, they added, is the processing cycle of the application.

The requirement is that the system should have been running long enough for its effect to be seen, but not so long that the environment in which the system was supposed to operate has been changed.

The handbook abounds with light, conversational phrases used to describe serious management attitudes or approaches. The authors define, for example, various roadblocks that may prevent effective post-installation evaluations:

- The hornet's nest syndrome – otherwise known as "don't disturb the sleeping giant," and distinguished by the thought that "we went through hell to get that blasted system in . . . You don't mean we'll have to go through it all again."
- The witch-hunt syndrome – otherwise known as "who wants to stick his neck on the chopping block." It's obvious to followers of this philosophy that an evaluation can have two basic verdicts – success or failure. If it is a failure, either the using department or the DP staff may block an effective investigation of the reasons for the failure.
- Forward, ever forward – DP resources are scarce and the users are busy, so who wants to look back anyway!
- Lethargy – "What the hell, anyway."

But if these obstacles are overcome, the user and DP staff may still have problems in running their post-installation evaluation. Wooldridge and London ask, for example:

- What system? If the system has been in operation a long time, many changes may have been made and the system modified out of all resemblance to its original form. In this case, should it be held together "with string and brown paper until it creaks worse than the one it replaced."
- Evaluate against what? This is perhaps the most damning of all the reasons for not doing an evaluation, the authors warned, and can be used anytime there never was a formal, reasoned, quantified user request against which the system can be tested for success or failure.

If there was a user request and an evaluation is undertaken, the handbook noted, the users and DP staffs can then ask:

- Did we meet the objectives and targets? Effective answers to this, however, presuppose some meaningful yardstick such as an adequately defined user request.
- Have the objectives changed? Even if an original yardstick was provided, has the dynamic nature of the business outmoded the specifics of the original request?
- Does the system work well? This is a general review of how the system operates, looking at economic and technical performance in both the user and DP areas.
- Were the objectives right in the first place?

The handbook was published in June and is available for $6.95 from Gambit at 53 Beacon St., 02108.

Mathematical, DP-Inclined User Can Create 99 Reports in 1 Pass

OTTAWA, Ontario – The Statistical Generator (Stag) from Information Science Industries Ltd. (ISI) enables the user strong in math or DP, but not necessarily both, to create programs to produce as many as 99 reports, in one pass of the system.

Stag is a Cobol source program generator using specifications taken from a simple worksheet that defines and arrays four dimensions for each data set to be used. Existing file and data declarations are utilized and different format multi-file input can be handled, ISI said.

The use of arrays to define the data means the company explained, that there is no need of sorting or other "grooming" of the input files before they are used. Stag also carries with it the availability of implicit statistical functions including: counts; sums; means; and vertical, horizontal and matrix percentages based on sums and counts.

There is a variable number of report layouts per pass of the master files, ISI went on, and these can be specified via shorthand notations, back referencing of specifications and detailed format choices. These options include variable-width columns, table lookups, arrayed subjects and ranged objects, among others.

Stag also provides the ability to specify whether qualifications are to be treated as being independent or mutually exclusive within page, row or column. The user also has the ability to specify set totals as being created by the summation (occurrence count) or tally (record count) method.

Stag's basic logic requires no more than 12K bytes of memory, but the system's basic effectiveness, in number of reports generated per pass of the master file for example, depends on the space available for matrices. The software allows the user to predetermine, through a given formula, the point at which the generated logic exceeds the computer's processing limits, ISI noted.

The system is written in Cobol and has been implemented on Burroughs, CDC and IBM mainframes. The source code can be purchased for $15,000 or made available on a 12-month minimum lease for $700/mo (Object code, including support), or $500/mo (source code, minimum support).

Stag is also available as a time-shared service based on ISI's own Burroughs mainframe. The company charges $10/session regardless of how many report programs are generated, plus the cost of CPU time. The user pays communications line costs but ISI does not impose any "connect time" fee on top of the CPU costs.

ISI is at 1755 Woodward Drive, K2C OP9.

New 'Ramis' Version Eases File Problems

PRINCETON, N.J. – Mathematica, Inc. has released a new version of its random-access data base management system (Ramis). Release 5.3 includes facilities to simplify file reorganizations and other problems often encountered when files are connected.

The new version of Ramis also enables user-authors to protect sensitive sections of data from unauthorized access even though the data is part of a master data base accessible in general to others.

The Ramis system has been implemented on IBM 360/370 under OS, and on 360/67 hardware for time-sharing uses. As a package for installation on a user's own equipment, it sells for $21,000.

Mathematica, Inc. can be reached through P.O. Box 2392, 08540.

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Manual Details Steps Needed to Bring DP Project to Full Operational Status

ATHERTON, Calif. – Application planning and development groups, from DP installations of all sizes with almost any kind of equipment in place, can use the Segmented Documentation Methodology (SDM) now being marketed by its developer, Katch & Associates.

SDM is not a software program nor a system of programs. Instead, it is a manual describing in great detail the steps that must be followed to bring a DP project – any project – from the first glimmer in the end-user's eye to complete operational status. With charts and narrative, SDM defines the steps, who must be responsible for them and why.

Needs Swerved

It also provides standard documentation forms and planned review points along the way to becoming operational, and these appear to be basic yet complete enough to serve the needs of any size organization. The large DP shop gains a standard approach to its multiple, concurrent projects; the small installation gets constant coaching on what needs to be done next.

The documentation flow fostered by SDM use enforces a standard approach to each project within the DP staff but stresses the need for interaction between the computer professional and the end users they should be supporting, Katch said. It is the user, for instance, who prepares the Project Initiation document after discussing his needs with the DP staff and management.

That document applies whether the user is proposing a new application or minor changes to one already installed. The next document, User Specification, is jointly prepared by the user and the project team from DP that will work on the system if it is subsequently approved.

Under SDM, the DP staff then works through Costing and Analysis, Feasibility Study and System Design Objective documents, prior to going before a project review board made up of user department and DP staff representatives.

This process of documentation buildup and review continues, but all documents must be approved at each review point or returned to the originator for rework until there is acceptance. At that time the project can go forward.

This requirement that all prior documentation satisfies each review board is vital, Katch explained, since selected parts of the development documentation later becomes part of the operations runbooks and user manuals. Ambiguities have to be cleared before they reach that status.

Katch admitted that SDM doesn't do anything that a good systems team wouldn't do on its own, and there are other somewhat similar packages available from other developers. But, he added, SDM does do the job – or rather, it helps the user and the DP staff do their jobs – and for that reason alone, it should be considered.

SDM carries a package price of $4,000, which includes manuals, training, sample forms and the right to reproduce more of them, and the indefinite use of the system.

Katch is at 36 Euclid Ave., 94025.

Full Range of Reports Generated on H200s With Enhanced 'Able'

EVANSVILLE, Ind. – Accountants with 24K Honeywell H200s and two disks can generate a full range of reports, journals and ledgers in a single pass, and a detailed audit trail of all transaction, with a new version of the Able accounting package and programming language, from Evansville Data Processing Corp. (EDPC).

The package is said to combine standard accounting procedures built into the Able logic with user-oriented flexibility made possible by accounting language entries, to produce just the financial reports the accountant wants.

Although the Honeywell version, which operates under Cobol C, is new, EDPC noted, the concepts behind it have been developed over a number of years. Previous versions have been implemented on IBM 360 and CDC RPC 4000 equipment, the company said.

The latest release is said to be compatible with the earlier ones.

The special Accounting Language supports user choice of report format and content, operations such as prorations of given figures and internally generated entries to keep journals and ledgers in balance.

The major value of the Able package, the company explained, is that it allows the accountant to work in his terms, without having to convert or twist his thinking to meet DP terminology or logical boundaries.

The Able package is distributed on a disk pack and is available for a one-time charge of $4,500 including unlimited followup, a spokesman said from 1010 S. Weinbach Ave., 47714.

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COMMUNICATIONS

Data Briefs

CRT Has Page-Size Copies

MOUNTAIN VIEW, Calif. – Photophysics has brought out a floor model CRT copier that is said to record a display image on 8-1/2 in. x 11 in. paper in eight seconds or less.

The Model 100F can be dedicated to a single CRT display or can be shared by up to eight terminals and monitors, the firm said.

The Model 100F accepts standard RS 170 video signals and contains a 12 in. monitor, optics, camera, paper moving device, developer and dryer.

The Model 100F copier costs $2,800 in quantities of one to nine from the firm at 1601 Stierlin Road, 94040.

Modem Designed For TTYs

PHOENIX – Omnitec Corp. has brought out a direct dial, auto-answer modem designed to convert teletypewriter terminals into hardwire, on-line communications stations for attended or unattended operation.

The unit resets itself to the answer mode after each call is completed.

A panel designed for mounting into the Model 33 or 35 Teletype is available and contains a rotary dialer plus controls or indicators for power on, half- and full-duplex, carrier detect, off hook, clear and an originate or answer selector.

The Model 4002 costs $465 in quantities of one to four. Delivery is 30 days from the firm at 2405 S. 20th St., 85034.

Terminal Displays Stock Quotes

STAMFORD, Conn. – GTE Information Systems has introduced its new Videomaster 7850 Brokerage Quotation Terminal.

The latest videomaster CRT terminal enables stockbrokers to select from up to 17 modular information services provided by GTE Information Systems. The terminal also allows users to communicate with their own data base, as well as entering and confirming orders.

The basic monthly service per office is $530, including maintenance, with additional charges for the terminals and various optional services required. First delivery is scheduled for 1974.

CCMI Offers Rate Analysis

RAMSEY, N.J. – The Center of Communications Management, Inc. has prepared an analysis of AT&T's proposed rate restructuring for private-line services.

Called "A New Private Line Rate Structure," the report includes sections on the proposed rate structure, on system configuration drawings, on network planning and optimization and has excerpts from the AT&T proposal.

The report costs $30 from the center at P.O. Box 324, 07446.

User Intermixes Devices

P-100 System Puts It All Together

By Ronald A. Frank
Of the CW Staff

CHICAGO – "What we needed was a remotely located processor that would support all the terminals that are unique to our industry. We already had 2260 discipline and protocol, a large number of 10 char./sec Model 33 TTYs in the field and our customers were telling us they wanted the flexibility to go to a 30 char./sec terminal."

This is how Jerry Zvonecek described his needs for a CRT-based system that could be integrated into the existing credit authorization system at Trans Union Systems.

"We also needed some type of local line printer and we had a variety of IBM 2770s, 2780s and 3780s in the field. What we wanted to do was intermix this equipment through one box and support it all over one line rather than following the IBM discipline of many lines, many control boxes and many problems," he said.

Trans Union operates an extensive credit authorization system between Chicago and St. Louis, and is expanding its system to the East Coast.

"We were looking for one controller that could support that variety of terminals – a 2260 type, a low-speed TTY concentrator that would be able to provide 10 char./sec support, and 30 and 60 char./sec support also. No one in the industry had anything like that available at the time we looked," he said.

"We talked to IBM and they proposed System/3 and System/7 type configurations; we also looked at Honeywell, Four Phase, Terminal Communications, but none of them had the ability or the desire to intermix all this equipment into one remote controller," he said.

Software Costs

"We rejected the IBM approach of 3270s because that would require us to change the software that drives our system, because we are still running in version zero of CICS. Going to 3270s and supporting the bisynch terminals would necessitate us bringing version 2 of CICS which would have cost another $800/mo," Zvonecek said.

"The implications of going with IBM were really a major overhaul of our system, but we wanted to stay with what we had in the back room and put our technology at a remote site through a concentrator that would handle all these functions," he explained.

Trans Union finally selected a P-100 intelligent CRT system from Raytheon. The CRTs will be installed at credit bureau offices from where Trans Union's customers will enter account inquiries into the Chicago data base. The user would not detail the exact cost difference between the IBM 3270 and the Raytheon system except to say the P-100 was "very attractive."

"We got cost savings and flexibility," he added.

The company now has 158 Raytheon CRTs installed in 14 cities and will soon install another 77. The vendor supplied the critical software for the remote controller/processors which will allow the Trans Union system to integrate its equipment mix. The software enabled the Raytheon CRTs to emulate 2260s to the system.

The credit authorization firm has a 370/155 in Chicago which stores 18 million accounts on-line. The central site now has a Memorex 1270 controller but it may be replaced with another front end to improve line utilization, he said.

The network operates on private lines at 4,800 bit/sec with ICC data sets. The company uses MCI lines between Chicago and St. Louis.

Communicating Typewriter System Rivals On-Line Data Terminals

HAUPPAUGE, N.Y. – Redactron Corp. has introduced communications features for its editing and power typewriters that brings word processing equipment into the on-line terminal category.

By adding IBM 2741, 2780, TWX and Telex capabilities to its "intelligent" typewriters, along with card or tape cassette storage, the Redactron equipment comes close to being a DP terminal.

The communications features include both a Communicating Magnetic Card (CMC) feature as well as Binary Synchronous communications in batch mode up to 2,400 bit/sec. The CMC designation is the IBM office products equivalent of 2741 start/stop transmission mode, according to a Redactron spokesman.

The Redactor Communicating Typewriters, as the series is known, can operate with single or dual magnetic card or tape cassette storage and the systems can be operated on either dial-up or private-line facilities. The equipment is compatible with Ebcdic, Ascii and Baudot transmission codes.

Although a variety of options is available, the communicating typewriters will start at $7,200 or $235/mo on rental with built-in modems. Separate features generally cost several hundred dollars each, the company said.

First deliveries of the communicating typewriters are scheduled for the first quarter of 1974 from 100 Parkway Drive South, 11787.

	IBM MT/ST with Communicating Mag Card	Redactron Communicating Typewriter
Media	Single card ONLY	Single and dual tape Single and dual card
Data Modes	Card or keyboard to card or printer Keyboard to computer and card to computer	Card, tape, keyboard to card, tape, printer, IBM-CMC and computer.
Lines	DDD, private	DDD, private (TWX, Telex)
Speed	14.8 char./sec (134.5 bit/sec)	7, 10, 14.8, 150, 225, 250, 300 char./sec
Error Detect	Character parity	CRC for high speed
Error Correct	Flag with a "z"	Retransmit seven times Goes to 600 bit/sec on noisy lines
Code	64/char. correspondence	Correspondence Ebcdic, Ascii, Baudot up to 256 char.
System	IBM 2741-compatible	IBM 2741, 2780, TWX, Telex
Lease	$60/mo, + $30 for modem = $90/mo	CMC-$60/mo + $6 (DAA) BSC-$66/mo + $6 (DAA) Both-$94/mo + $6 (DAA)
Purchase	$2,700 + modem	CMC-$1,710 incl. modem BSC-$1,885 incl. modem Both-$2,705 incl. modem Power typewriter $5,500

Chart compares characteristics of IBM magnetic card Selectric typewriter (MC/ST) system and Redactron system. Both have communications capability.

Correction

The recent article relating to testimony given by Clinton D. Warkow, corporate communications manager for Montgomery Ward, before a Senate subcommittee contained some incorrect modem prices [CW, Aug. 29].

The company is paying $235/mo for its non-carrier 9,600 bit/sec data sets. For its 4,800 bit/sec non-carrier data sets, the company originally paid $137.60/mo. This figure was subsequently lowered to $85/mo after two years when the vendor applied a 14% discount to the monthly charge.

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This modem is really something, Ma. It provides four times the data rate of your 103 while maintaining the same line discipline for connect, hand shaking, and disconnect. Imagine eliminating the complicated and inefficient half duplex mess forever. The zero turn around delay will save bundles on line costs.
I hate to tell you, Ma, but the VA3400 can be used in Vadic's Multiple Data Set or standalone units which have analog and digital loopback, display of all EIA interface signals, built-in 300 and 1200 baud test signals. It can also be used with any of Vadic's automatic dialers.
The price? Better sit down, Ma. Just $750, with OEM discounts available.
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TOKYO – The pride of the National Railway, the on-line real-time system Mars 105, well-known at the Green Windows of the railway, is pivotal in this area of universal leisure. Accompanying the opening of the Sanyo Shinkan Railway the 105's processing capacity has been pushed to its limit, necessitating system expansion.

The central equipment of Mars 105 is a multi-system consisting of two Hitac-8700s, but with increases in the number of travel reservations handled, an additional Hitac-8700 system will be installed and is expected to start operating in the fall of 1974.

The Mars 105 system began operating in January of 1973, and through National Railway's circuit network it has become possible to make seat reservations from any part of the country. The 105 system can receive 650,000 reservations in a day.

During the Bon Buddhist festival and the year-end holiday season, times for the heaviest nationwide movement of people, the number of calls made almost doubles those calls received. On two separate days the number of calls per day reached 1,135,000. On such occasions, the number of valid seats reaches 50% of the total demand, leaving half of the people unable to obtain seats.

The total number of peripherals used at the Green Windows is 1,300, but the possibilities of adding 100 to 200 more as well as speeding the peripheral printing rate (currently 200 bit/sec) are being investigated.

The reason for the addition of a system similar in scale to the present central processing equipment is that it has become impossible to increase drum storage capacity.

It is estimated that with the new system the current number of reservations received should go from about 700,000 to one million, and in the future to about 1.4 million. The new system is designed to handle the separation of line control from file relationships as well as handle the processing of traffic.

Along with Mars 105 for passenger seats, National Railway is hurrying to complete "Epochs," a system for reserving freight liner (express freight) containers, and so will install Univac's U-494.

Moreover, in order to expand its passenger and freight reservation systems and to improve its services, it will make additions to its central equipment and terminals. It will advance the development of high-speed terminals and the utilization of displays along with a speeding of terminals at train stations where demands are high.

Nerem Workshop Planned On Future Developments

BOSTON – A one-day workshop discussion on the "Next Decade in Telecommunications" will be held Nov. 6 as part of the annual Nerem conference.

The workshop will present an overview of outstanding near-term technological innovations in the field of telecommunications. Included will be the effect of competition on the technical aspects of common carrier telecommunications, and a look at the potential limits of growth in computer/communications.

The keynote speech of the session will be presented by Bernard Strassburg, chief of the FCC's common carrier bureau, who will discuss problems relating to competition and regulation in telecommunications.

The afternoon session will be devoted to a panel discussion on the limits of growth in computer communications.

Growth Limits

Panel moderator will be Louis Feldner of the FCC who will be joined by Dr. Paul Polishuk, acting deputy director, Office of Telecommunications, U.S. Department of Commerce; Robert E. LeBlanc, Saloman Brothers; Thomas N. Pyke Jr., chief of the computer systems section, Institute for Computer Sciences and Technology, National Bureau of Standards; and Col. Andrew A. Aines from the National Science Foundation.

The morning session will deal with new technological developments including future telecommunications interfaces, the role of microprocessors in future telecommunications systems and microwave technology projections.

Registration fees for the workshop are $35 for IEEE members, $40 for non-members and $10 for students. Details are available from Dr. R. Christiansen, Arthur D. Little, Inc., 32 Acorn Park, Cambridge, Mass. 02140.

Users Eye Specialized Carriers

NEW YORK – More than 80% of today's major communications users believe they will utilize the services supplied by the specialized common carriers in the future.

This is one of the conclusions reached in a study of specialized carrier transmission services issued by Frost & Sullivan, Inc.

As part of the study, 200 large communications users surveyed said they believed one or more of the new carriers would serve their organization. The users said they were attracted to the specialized carriers primarily by the more favorable costs compared with existing carriers.

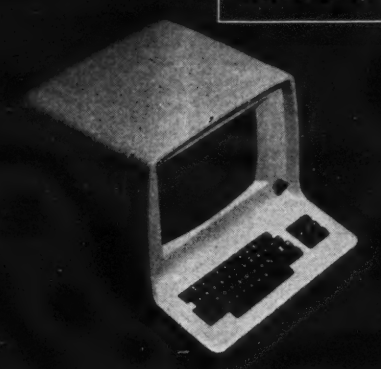
The users said they expected the existing carriers to introduce new and improved services as a direct result of the specialized carriers beginning to offer facilities to users.

The report said MCI is the only new carrier with sufficient financing to construct its planned national network. Southern Pacific Communications, Eastern Microwave and U.S. Transmission Systems (ITT) are dependent on their parent companies for financing to build their nets, the report said. Datran, which plans a national switched digital data system, is presently looking for financing, the report noted.

Users spent $300 million in 1972 for private-line data networks and $150 million for dial-up nets, the study said. It estimated that by 1975 users will be spending $608 million on private lines and $370 million for dial-up facilities. The figures include all line charges exclusive of equipment. The report is available from 106 Fulton St., 10038.

Compare Cost And Capability

Wyle 8000 vs. IBM 2260



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CRT's Per Controller	8 or 16	16
Non-Destructive Cursor	Optional	Standard
Colon Seeking Tab	Optional	Standard
Line Address	Optional	Standard
Character Address	No	Standard
Character Insert	No	Standard
Character Delete	No	Standard
Erase Display	Standard	Standard
Erase End Of Line	Optional	Standard
Erase End Of Screen	Optional	Standard
Repeat Key (All Char)	No	Standard
Printer (Optional)	15 cps	100 cps
Columnar Tab	No	Optional
Lower Case Alphabet	No	Optional
Function Keys	No	Optional
Numeric Inset	Optional	Optional

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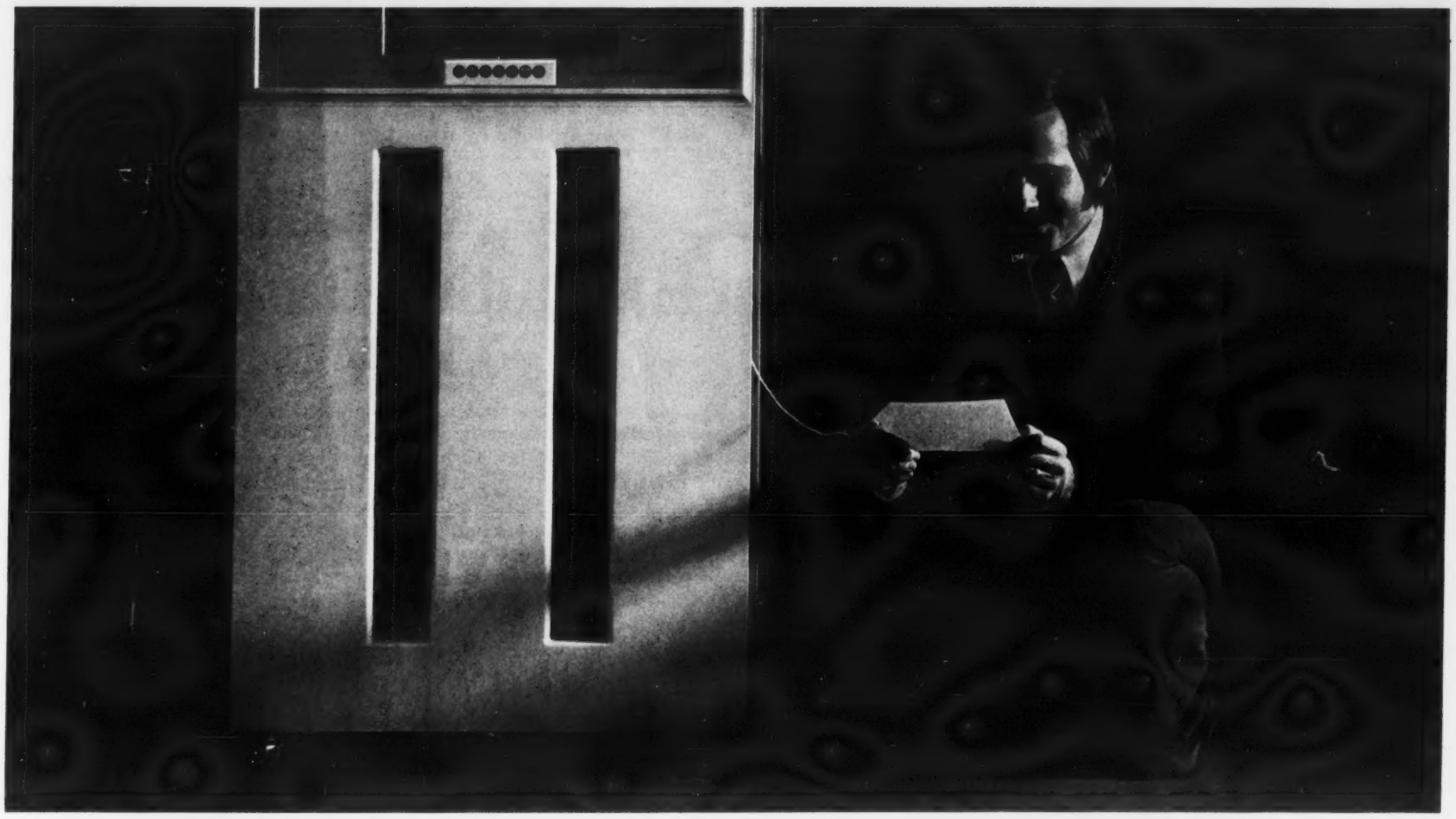

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CALCOMP

Datapoint delivers at Executive Data

Executive Data Systems, Inc., Cedar Rapids, Iowa, is a national leader in supplying computer utility services to the health care field. Currently over 100 hospitals and health centers are subscribers to Executive Data's computing services for applications in general administration, patient accounting, medical diagnosis, laboratory analysis and many other critical areas. The great majority of Executive Data subscribers are now utilizing Datapoint 2200 systems and printers as on-site terminals for data entry, for data communications (to Executive Data computers in Cedar Rapids) and increasingly for on-site data processing.

Why Datapoint? "The Datapoint 2200 meets the needs of our hospital and health center clients more fully and more satisfactorily than any other computer system," notes Don Olson, Executive Data president. "Its full programmability and the availability of DATABUS, a high-level programming language, makes it easy to adapt the system to the varying data entry requirements of our clients. On the 2200's video screen we can display the precise format for data to be entered, which, combined with programmed error checks, virtually eliminates input errors. Since the 2200 is as easy to use as a typewriter, there's no need for special operator training as with a keypunch machine. During the day the transmission of data to our central computer occurs automatically, without the need for manual dialup. Similarly, needed management reports are sent out automatically from our central computer during the night to an unattended 2200 printer, ready for management to use the very next morning, when the information is really timely and useful."

Every hospital and health center has varying needs for computer service, which can range from simple bookkeeping to sophisticated computerized analysis. Executive Data's approach is to provide these services on a modular basis. "Because the 2200 is a fully programmable general computer, it can handle much of the burden of editing and pre-processing of data," said Mr. Olson. "This relieves much of the overall processing load on our large central computer systems. Additionally, as hospital users grow more sophisticated and demand more and varied applications, we expect to see the Datapoint 2200 used more frequently as a supplemental independent processing unit."

The Datapoint 2200 and associated peripherals have delivered the goods for Executive Data Systems and its numerous hospital subscribers in a variety of applications in data entry, data communications and dispersed data processing. Prices on this unique system begin as low as $6,040. For information on how this capability can be put to work in your operation, contact the Datapoint sales office nearest you or write or call: Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284.

Datapoint

"The Datapoint 2200 has been a key factor in the continued growth of Executive Data and in our ability to provide the finest computing services in a modular and economic fashion to our clients. As the health care field grows more aware of the capabilities of our service in combination with Datapoint systems, I anticipate a steady rise in the number of our subscribers and in the processing volume we undertake for them."

Don Olson, President,
Executive Data Systems, Cedar Rapids, Iowa

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Bits & Pieces

Itel Offers Full Package Lease on IBM 370 Systems

SAN FRANCISCO – Prospective IBM 370 Series users can obtain a full system from Itel Corp. on an operating lease basis for terms of two or three years at savings up to 40% of comparable IBM rental, according to the firm's spokesman.

As an example, the spokesman configured two identical systems, one from Itel and the other from IBM, and compared costs.

The IBM system consisted of a 370/145 central processor with 512K bytes of IBM memory and eight 3330 spindles. The Itel offering consisted of the central processor with 512K bytes of memory and eight spindles of Itel's 7330 disks – 3330 equivalents.

Monthly rental for the two sample systems on a two-year lease including maintenance, insurance and taxes is $27,510 for the IBM-supplied system and $21,621 for the Itel offering.

The firm is at One Embarcadero Center, 94111.

COM Course for Government Units

PHILADELPHIA – A two-day seminar on "Computer/Microfilm Interfaces" will be held here Nov. 15 and 16 and is open to all federal, state and local government employees.

Conducted by Dataflow Systems, Inc. of Bethesda, Md., under the auspices of the U.S. Civil Service Commission, the seminar will cover computer output microfilm (COM); various microforms available; microfilm systems design; and microfilm equipment.

The seminar outline promises to use computers and microfilm in combination to present a "balanced view of work now being done using computer/microfilm interfaces and to discuss the cost/benefits of such approaches."

Further information can be obtained from the Regional Training Center, U.S. Civil Service Commission, 3004 Federal Office Bldg, Seattle, Wash.

Periodical Offered on Data Entry

CHERRY HILL, N.J. – Users with data entry applications can obtain Management Information Corp.'s Data Entry Awareness Reports on a subscription basis starting in 1974.

These reports feature "editorial comment on data entry topics, compilations and pertinent facts on new data entry systems and applications, industry information and feature sections on selected data entry products."

The Awareness Reports will be issued six times a year for $24. Additionally, new subscribers will receive all 1973 issues free from the firm at 140 Barclay Center, 08034.

Making Hardware Work Better–Part I

Monitors: a Great Untapped Resource

By Michael Weinstein
Of the CW Staff

PROVO, Utah – Users are going to have to make better use of equipment monitors or passively sit by and "watch as the computer sputters with incredible inefficiencies," according to Gary Carlson, director of computer services at Brigham Young University.

As an example of these inefficiencies, Carlson asserted, "Most computers presently are giving less than three hours of productive work out of every 24." While most computers are operating 24 hr/day, they actually execute instructions only 30% of the time. The 30% working time is further deflated, according to Carlson, by the fact that "overhead can often run as high as 40% to 50%."

The answer to these "incredible inefficiencies" is monitoring. "Monitoring will allow the user to get precise and exact measures of what is happening in the system. These measures can significantly reduce the guesswork in selecting new machine components and improving program performance," he added.

Comes in Two Flavors

The two standard approaches to monitoring are hardware and software monitors. The salient features of each are outlined in the accompanying chart.

Hardware monitors are essentially small, special-purpose counting devices that attach electrically to pin points of any electrical/electronic device.

The monitors sense electrical activity with counters that record time and events.

Probes are directly attached to the computer equipment and lead into the counters. Monitors typically have eight, 16 or 32 counters and can thus record simultaneous activity in a system. Basic measures taken as starting points include CPU percent active, channel activity, channel and CPU overlap, system wait state and other activity not overlapped with other system functions.

Software monitors are specialized programs run with application programs and keep a record of system functions during a given program execution.

Software monitors cause some slight degradation in execution time, Carlson said, "but they can generate a lot of information in a short time."

These monitors can gather any information available through programming and have no set limits in terms of counters, but rather are limited by the amount of memory the user wants to dedicate to their use, Carlson added.

But, with few exceptions, Carlson said, most software monitors are available only for use with IBM systems.

These monitors should not be confused with typical accounting routine functions, he said. "Monitors can get extensive information about hardware and program performance, whereas most accounting routines can only log activity used to charge customers for resource used."

In either case – hardware or software – monitors are essential if the user wishes to save money, understand the system and indicate future hardware and software development areas, he explained.

Part II of this series will deal with effective use of hardware monitors.

Hardware Monitors	Software Monitors
Can be attached to any computer or peripheral through electrical connection	Runs as problem program
Requires no memory or other overhead and does not interfere with normal computer operation	Takes 6K to 12K bytes memory
Address easily obtained with comparators	Loading of program is generally trivial
Sampling rate can be controlled independent of computer or tied to computer cycles	Consistent measures always possible once program is debugged
Simultaneous multiple measures normal	Overhead runs from 1% to 10%; typical overhead is 1% to 5%
Can attach to IBM or non-IBM equipment	Easy to get labels
Probes can be attached to wrong points giving misleading information	Address easily obtained
Probe attachment takes time and skill for each measurement	Sampling rate dependent on computer cycles
Difficult to get labels	Running program is no problem for CEs but makes sales reps nervous
Attaching probes gets CEs and sales reps very nervous	Can run only on machine for which it is programmed
	Can only measure information available through machine commands
	Simultaneous measuring impossible – approach it by frequent sampling
	Most software monitors are available only for IBM 360 Series

John Carlson's Summary of Differences Between Hardware and Software Monitors

New Disk Unveiled for HP 2000F

PALO ALTO, Calif. – Hewlett-Packard has changed the technology used in disk subsystems for the 2000F dual-processor time-sharing systems from fixed-head disks to moving-head disks.

For the user, the move from fixed to moving heads means an equal storage capacity at a lower cost. The trade-off is that access time for moving-head disk subsystems is slower than for fixed-head-based systems.

Speed is not essential, an H-P spokesman argued, as the 2000F Series is used primarily with the Basic language. The argument is that as Basic is an interpreter (as opposed to a compiler), there is less need to move onto and off disk.

Tests taken by HP with the moving-head subsystem indicate a two-second response time is exceeded only on larger systems when all terminals are operating simultaneously with highly interactive programs, the spokesman asserted.

The two new systems created in the 2000F Series are the Option 200 and Option 205. The Option 200 uses from one to eight HP Model 7900A 4.8M-byte disk drives. With one disk it costs $75,950 (omitting terminals) compared with $109,000 for the previous Model 2000F Option 210 with approximately the same data capacity but with fixed-head disk drives.

The 2000F Option 205 uses from one to eight HP Model 2883A 23.5M-byte moving-head disk drives. Its price with one disk drive is $88,450 compared with $121,500 for the previously announced 2000F Option 215 with the same storage capacity using the fixed-head drives.

Access times for the Option 200 and Option 205 moving-head disk subsystems are 47.5 msec and 44.5 msec respectively. Access time for the equivalent storage capacity fixed-head systems is 8.7 msec.

Paper and Mylar Tape Copied and Verified

AUSTIN, Texas – A system that duplicates and verifies both paper and mylar tapes is available from Unitech, Inc.

The Unitech duplicator/verifier (TDV-501) consists of two paper tape readers, a punch and tape processor to verify two tapes at 150 char./sec and duplicate a punched tape at 75 char./sec.

Cost of a basic system is $8,000 from the firm at 1005 E. St. Elmo Road, 78745.

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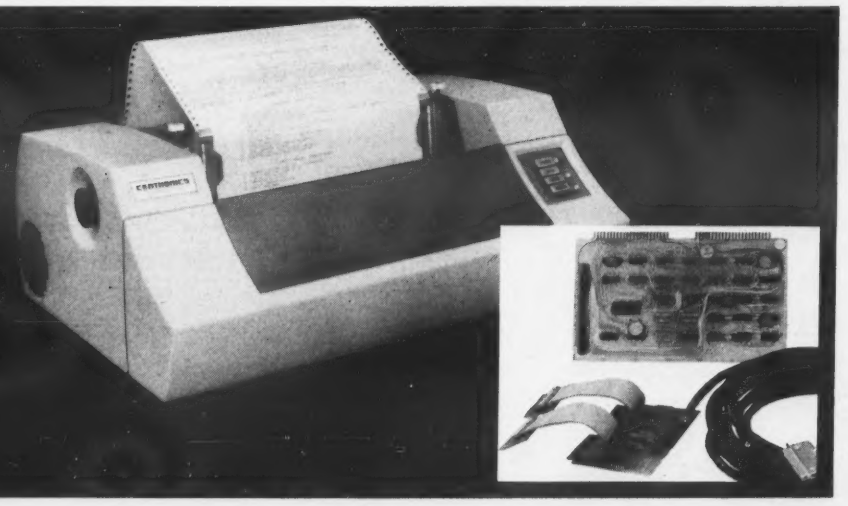

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With all that hardware/software muscle, the 840 has embarrassed a lot of far bigger computers in price/performance benchmark comparisons.

For instance, there was the XDS Sigma 7 that was 40% faster running an independently conducted Fortran benchmark. And then got wiped out by the 840's more-than 10-to-1 price advantage.

Or the DECsystem-1050 that cost eight times more than the 840. And was actually 7% slower running the benchmark.

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DATA GENERAL
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Tape Good in Extreme Uses

GRAHAM, Texas – Graham Magnetics, Inc. has unveiled a new "super tape" that can be used for applications in temperatures ranging as high as 400° F and as low as 65° below zero.

These ranges compare, according to the firm's spokesman, to operating temperature ranges from +50° to +90° F for "the best" magnetic tapes previously available.

Initially the new tape, designated "Thermo-465," will mostly appeal to Air Force, space or geographic applications where extreme temperatures are found.

But the new tape could find its way into applications where extra cost is a form of insurance against natural disasters such as fires – "for example, at the Army Records Center, where a fire destroyed large reels of information," the spokesman said.

Thermo-465 is offered in 1/4-in. and 1/2-in. widths and 1,000-ft lengths. Price for 1,000 ft of 1/4-in. tape and reel is $109.37. Price for the same length of 1/2-in. tape and reel is $229.70.

Read/Write Memories, Adjustable I/O Standard in Programmable Controllers

MAYNARD, Mass. – Four years after the first PDP-14s were introduced for industrial applications, Digital Equipment Corp. has introduced its "second generation" of PDP-14 programmable controllers.

In addition to offering as standard features available as options with the older units, the newer 14/30 and 14/35 incorporate a read/write memory and the ability to grow with users' requirements by adding I/Os one at a time.

These "one at a time I/O additions" are carried out by plugging in the required signal converters and attaching the external wiring.

The maximum number of inputs for the largest system is set at 512 with maximum external outputs set at 256.

The 14/30 comes with a basic memory of 4K words to which a second 4K words can be added. The 14/35 comes in only one size: 8K words of memory. Cycle time for both units is 2.5 msec per 1K word of control program, a spokesman said.

Released with the newer controllers is the portable VT14 programming terminal that displays all control circuits on a video display screen. In operation, the control engineer plugs the control terminal into either system and enters the control-system schematic in terms of relay diagrams, one output at a time.

The control engineer enters the ladder diagrams, contact by contact, making the required connections. Ladder diagrams with 10 contacts in series and up to eight contacts deep can be displayed in a matrix of up to 80 contacts and branch points.

Price for the new systems begins at $3,600 with the programming terminal priced at $5,990. First deliveries are expected for November of this year.

Display Controller Has Own Memory And Bus Readout

ANN ARBOR, Mich. – Direct readout from parallel data peripherals such as paper tape, keyboards and card readers is provided by Series RO200C Parallel Display Controllers, available from Ann Arbor Terminals, Inc.

The Series RO200S provide data display from a computer data bus and operate with 7-bit parallel Ascii data at up to 1,620 char./sec asynchronous. It has full cursor control, plus an MOS dynamic shift register memory which stores up to 1,920 characters – a full screen.

A display set of 64 alphanumeric characters is provided with display formats up to 80 characters by 24 lines.

Data is stored, and the underline-type cursor is positioned under control of a memory address register in the controller. Eight cursor command characters operate on the memory address register to effect the specified cursor movement. Each entry overwrites the character previously displayed at that position.

Output is composite video with an optional TV output capability that enables the controller to drive standard TV sets. Multiple monitors can be daisy-chained.

Prices of the three models are determined by the character format capabilities. The RO204C (32 by 16 format) costs $790; the RO206C (80 by 16 format) costs $940 and the RO208C (80 by 24 format) costs $1,070. All units are available from the firm at 6170 Jackson Road, 48103.

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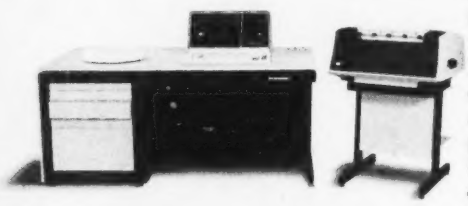

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CW SPECIAL REPORT

★ The Input Revolution ★

On-Line Systems Fast Replacing the Punched Card

Messengers who deliver stacks of punched cards to DP centers are fast being replaced by on-line data entry systems. This special report looks at some of these new input systems and the users who are implementing them.

•Point-of-Transaction Terminals Capture Retail Sales at Source

With the increasing trend among DP users to capture data at the source, some very important changes in the way information is gathered are also emerging.

When computers were relatively new on the business scene it was the accepted practice for DP users to bring the data to a special information gathering department. Here data brought in on hardcopy formats was converted to cards through the familiar keypunching operation. But as terminal/communications technology advanced, it became clear that important cost and time advantages could be achieved if the data to be processed could be captured at the source of the transaction.

Probably the largest of the burgeoning point-of-transaction areas is that of retailing. Usually called point-of-sale, this process involves the installation of a teleregister at a retail sales counter that has the capability to perform many separate functions.

The most obvious operation the POS system performs is to total up the sale and provide the clerk with a cash drawer to store money and make change. But many of these systems also closely monitor inventory levels and provide credit authorization capabilities.

Most POS systems require a minimal amount of training and in retailing, where personnel turnover is high, this can be important to the user. Additionally, with conventional registers, cash shortages are not unusual in department stores. Many of these shortages are caused by human error rather than planned theft but either way they pose a major headache for store management.

The POS system eliminates much of this problem. With all transactions run on a processor, either on-line with the terminals or later in batch mode, the margin for error is greatly reduced.

Optimum Terminal

At a recent conference of the National Retail Merchants Association, Harry Schreiber, a POS expert with Peat, Marwick & Mitchell, described the optimum terminal as including "internal programmability, a tutorial keyboard, the ability to perform calculations and extensions, handle credit authorization, do check digit verification, require digit entry enforcement, capture data, have communications capability, perform automatic code reading, and also perform all traditional cash register functions."

According to *EDP Industry Report (EDP/IR)*, published by International Data Corp., this ideal type of POS terminal brings two types of immediate savings to the user. First, the user has people savings in clerical, accounting and purchasing operations. These savings, plus the increased speed in handling customers, can amount "to a very conservatively estimated $44,000 per 10,000 employee hours in a store's total operation."

(Continued on Page 28)

•Funds Transfer, Food Checkout Among Growing POS Applications

Two areas in which on-line point-of-transaction systems are growing are banking and supermarkets.

In banking the on-line transactions are called Electronic Funds Transfer Systems (EFTS) and the goal of this approach is to eliminate the shuffling of paper that occurs when checks are passed between banks.

There are, of course, other types of transactions involved with EFTS such as instant credit authorizations and electronic check cashing, but the primary goal is the elimination of the paper document.

The problem is huge. Most checks are processed by reading the MICR records imprinted on the bottom, and more than 20 billion documents of this type were processed in 1972, according to the *Auerbach Reporter*. The volume of checks is growing at 7% annually and is expected to reach 40 billion in 1980, the publication predicted.

The control problems associated with EFTS are "monumental," according to Art Lemay, president of Savings Management Computer Corp. As a service company for savings banks, SMCC is vitally concerned about the importance of automating the banking system.

But a start has already been made, Lemay said. More than 98% of the savings banks in the Boston area are already operating on-line for passbook transactions and other operations while only 25% of the commercial banks have taken this step, Lemay pointed out.

One of the most pressing needs for EFTS is in the bank card credit plans. Many banks which follow this type of credit plan have had high losses from "hot" cards and other fraudulent activities, Lemay said.

One of the attractive points of these card plans is that the cost of the transaction is paid by the merchant. This makes it easier for bad transactions to occur since there is no initial fee associated with obtaining the card, Lemay said.

The banks would like to cut their losses from these bad credit transactions, and on-line authorizations are becoming a

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If You Can't Bring Data to the CRT...

...Take CRT Around Factory Floor

CLEVELAND – If you can't bring the data to the CRT then the best plan is to bring the CRT to the data.

That is the approach at Bobbie Brooks Inc., a national clothing manufacturer. The firm controls a two million yard fabric inventory, central cutting of more than 13,000 dozen garments weekly, plus the preparation of 2,500 invoices daily.

One of the biggest problems is accurately keeping track of the inventory. When yard goods arrive at the factory, an operator sitting at a desk-top CRT physically inspects the material to be sure it coincides with the data listed on shipping documents.

The CRT is mounted on a fork-lift truck, and the operator can travel through the aisles inspecting the goods, according to David Daily, director of management information services. Cables are run overhead to allow the CRT to get power and other required interfacing wherever the fork lift travels, he explained.

Much of the up-to-date data gathering is based on the Bunker Ramo 2200 CRTs which the firm uses on-line with its IBM 370/145. At sites where hard-copy answers are required, the company uses Memorex 1250 receive-only printers.

Bobbie Brooks has about 45 CRTs which handle 15,000 inquiries per day dealing with all phases of the production distribution cycle. The CRTs are used for order status, inventory records, order file maintenance, on-line updating and similar operations.

The CRTs on fork lifts allow the direct entry of permanent storage locations, thus updating inventory files in addition to confirming shipping data. This helps to reduce situations where yard goods available in inventory cannot be located, Daily said. The inventory is often time-perishable in that it must be used before it is no longer in style.

CRT requests by production control offices for cutting orders generate combined cutting orders and shipping bills of materials which are initiated by the 145 and printed out on the 1250 printers.

Order status inquiries are entered on the displays and answered on-line either from the CRT screen or with a hard copy. The printers are interfaced with the same control units that operate the CRTs.

Before installing the present system, the company manually posted records or used a punched card system. "Handling 12,000 to 15,000 punched cards per day was a tremendous chore. We had no immediate reference to our computer. At best, information was updated 24 hours after the fact," Daily said.

Delores Kinney inquires CRT display, connected to one of the Memorex 1250 on-line communications terminal printers used throughout the Bobbie Brooks production-distribution system.

Data entry is now on-line and the errors inherent in keypunching have been eliminated, he said. The time-consuming manual forms have been drastically reduced and the company has been able to discontinue the use of numerous keypunches, verifiers, an 1130 CPU, and a 402 electronic accounting machine, he added.

The on-line system is operational 18 hours per day, and the data base runs under DOS with a 600M byte disk file. The Bobbie Brooks DP staff wrote all the software for the system including the teleprocessing monitor that runs the CRTs and printers.

On the Inside

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Terminals Capture Retail Data at Source

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The savings in reduced cash register shortages are "slightly higher than people savings," according to *EDP/IR,* but on the debit side the hardware cost is quoted "as more or less a washout in new construction with POS possibly costing a fraction more than conventional systems."

The main benefit of the POS system "lies in its ability to closely control inventory and monitor department and storewide sales activities," according to the *Auerbach Reporter,* issued by Auerbach Publishers, another DP research firm.

Timely Action

"Better inventory control can result in reduction of markdowns as well as out-of-stock conditions. Timely information on department and store sales activities allow store and corporate management to take timely action to improve business operation," the *Reporter* said.

EDP/IR estimates that there will be 35,000 POS installations in "general merchandise stores by year-end 1973." It is not surprising that the largest retailers are looking to the largest POS suppliers to provide terminal systems. Sears Roebuck is using Singer, along with J.C. Penney, while Montgomery Ward has selected NCR POS equipment.

But smaller department stores have found that equipment from other suppliers can often provide important benefits. The Bullock's chain on the West Coast uses American Regitel equipment because this company provides credit verification capabilities along with the other POS features.

One major recent development for POS users to consider is the IBM announcement of the 3650 Retail Store System. Although the IBM system did not include any startlingly new features for POS customers, the obvious compatibility with 370 mainframes is important to those who already have an IBM CPU in the back room. But IBM apparently will discourage the interfacing of its POS systems with 360s while other terminal suppliers may be more liberal in this regard.

Most POS systems still operate in local mode. This usually involves a group of terminals in a store reporting to a local controller.

Many of these controllers include the capability to transmit batched data collected from individual terminals. Most of these systems, however, batch the data onto magnetic tape or other storage media which are then manually transferred to a central DP center.

There are obvious exceptions. Large department stores which may have multiple selling floors together with a DP center in the same complex, can more readily collect their data on-line.

The switch to on-line operations, even from remote branch stores, is inevitable. Most POS users want to prove the value and reliability of their systems before they can take on the additional overhead associated with telephone line costs and data transmission equipment.

IBM's POS Entry Affects All Users

The entry of IBM into the point-of-transaction field has some important ramifications for all computer users, according to *Newscom,* a publication of Datapro Research Corp.

The IBM introduction represents further affirmation that today's EDP action is at the remote terminal location where the automatic data capture, input and remote processing functions represent the biggest problems to be solved and the areas of largest potential savings for users, the publication said.

"Automated data acquisition/entry, distributed processing, and of course, teleprocessing, or eventual communication with the readily accessible data bases of the central computer system, are where the important system development advances are taking place these days," *Newscom* said.

Banks, Supermarkets Growing POS Users

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must, he said.

Thoughts From Home

One of the potential applications of a full EFTS system is the proverbial terminal in the home. The consumer would be able to order tickets to a ballgame, pay his utility bill and shop for the week's food, all from his living room terminal.

Over and above the equipment and transmission facilities required for this type of capability is the banking question.

The customer must have a record of his transaction. Some systems have included strip printers with the home terminals, but accurate record-keeping in a fully automated bank transaction, done without the physical exchange of a check or cash with a receipt, is still a problem.

Obviously, if the paper audit trails required to follow up became excessive, they could nullify much of the advantage of the EFTS concept.

Thoughts From the Market

In the supermarket, the industry has taken the first step toward automated checkouts in which all products would be automatically scanned. The Universal Product Code, assigning a specific set of numbers to each product, has been officially adopted.

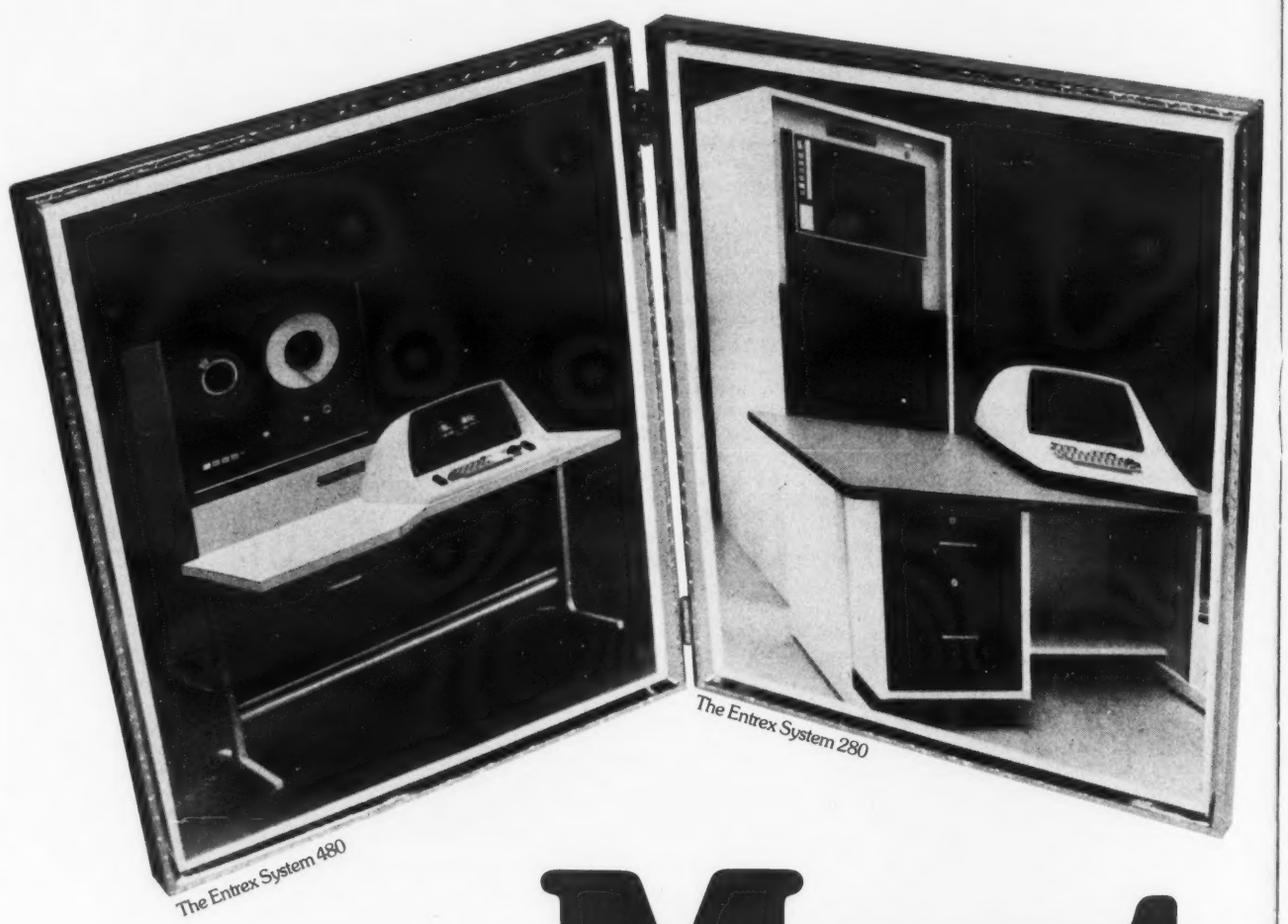
But implementation will take some time. A typical supermarket contains thousands of items and each will have to be properly marked with the appropriate symbol. And despite various announcements from suppliers that scanners and wands will be available to read the UPC code, this type of product is still essentially in the development stage.

More Sophisticated

Meanwhile, the on-line checkout terminal with data entered by the clerk is becoming more sophisticated. Most of these are only one or two steps removed from on-line operation to a CPU.

In both banking and the supermarket, the security aspect is critical. When transmission lines begin to carry data relating to credit information, store receipts, charge account balances and all the related information associated with on-line systems, the operators will demand built-in capabilities designed to keep confidential and proprietary data from falling into the wrong hands.

Nevertheless, both EFTS and the fully automated supermarket are not very far away. The technology and proper implementation will undoubtedly be combined.



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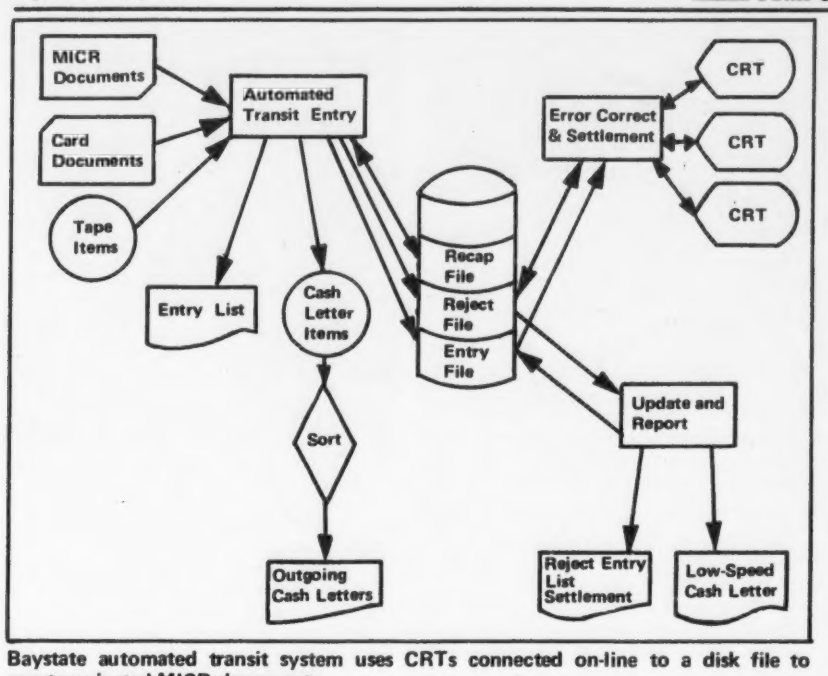

Baystate automated transit system uses CRTs connected on-line to a disk file to reenter rejected MICR documents.

CRT Keyboard Speeds Reentry Of Rejected MICR Bank Checks

WALTHAM, Mass. – CRT/keyboard reentry of rejected MICR items is helping Baystate Computer Center handle up to 500,000 checks per day.

Baystate is a complete DP service center for Massachusetts banks and one of its primary services is the processing of checks. The documents are fed through IBM 1419 MICR readers and the rejected items are separated for later reentry into the computerized system.

The rejected checks were originally handled by keypunch operators who had to punch a card containing all the MICR characters appearing at the bottom of a check. Often this operation required up to 30 characters per check.

But Baystate has speeded the processing of rejected MICR items by introducing a CRT system. The first step in this transition was the installation of a Periphonics Corp. T-Comm 7 front-end processor. This allowed the company to combine its audio response system (used for another application) with the CRT check reentry operation. The T-Comm front-end replaced an IBM 7770 and a 2701 line controller and combined both functions into one unit, according to Ken Sullivan, vice-president at Baystate.

The front-end interfaces with a C-Pac 3370 video display system from Periphonics which gives the clerks handling rejected MICR items on-line capability with the dual DOS 370/145s at the DP center.

Exception File Generated

As checks are rejected by the MICR reader, an exception file is generated in the on-line 2319 disk storage operating with the IBM 370s. The rejected documents are then given to a Baystate clerk who calls up each rejected check onto the CRT screen. The display cursor moves immediately to the beginning of the record that was not read by the MICR reader.

The clerk looks at the check and determines why the document was rejected, enters the proper characters to complete the record, and the file for that particular batch of checks is automatically updated.

Among the benefits of the CRT system, Sullivan cited the elimination of the keypunch operation, faster reconciliation of batch totals, and the elimination of a second card entry into the system and a second reconciliation.

Baystate originally had six IBM 129 keypunches. But the operation is now run on four CRTs installed at the site. The displays are supplied by Periphonics which in turn acquired them from Applied Digital Data Systems Inc. for inclusion into the C-Pac 3370 system.

The transit entry system (as Baystate officially calls it) also includes four remote CRTs operating with Bell 202C data sets over private lines at 1,200 bit/sec. The teleprocessing software includes the Periphonics input/output control system (Periocs) which has allowed the company to eliminate the IBM Btam access method previously used, according to Joe Sayers, assistant vice-president.

CW Photo by Ronald A. Frank

Checks rejected by MICR readers are reentered into system by Mary Piscatelli at Baystate Computer. CRTs help speed the processing of rejected documents.

A major benefit of the CRT system, is that the training time for new operators has been cut from four months to one week, according to Sullivan. And another advantage is that the on-line file update actually takes up less time than the CPU runs previously required to process the punched cards.

If the present system has not been installed, Baystate would have had the IBM 7770 plus five 270X line controllers to do the same work now being handled by the Periphonics system, Sullivan said.

About the Author

This special report was prepared by Ronald A. Frank, *Computerworld*'s Technical News Editor. Frank is also editor of the communications section.

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POS Revolution Still in Future, Marked by Specialized Systems

By Evan Ragland
Special to Computerworld

A point-of-sale revolution has been forecast every year since 1967 with many major corporations introducing point-of-sale products to "revolutionize retailing." The point-of-sale market has, in fact, developed over the past five years into a major segment of the business equipment industry, but this development has been remarkably inconsistent with the forecast of both the suppliers and the users of point-of-sale equipment.

Rather than revolutionizing retailing, point-of-sale systems have systematically automated some of the retail functions to the advantage of the retail user. But the complete conversion is still numbers of years away.

Perhaps the foremost contribution point-of-sale has made to retail systems to date has been in the area of credit automation. Authorization systems provided by several different companies began to appear in the late 1960s, and by 1972 were proven to provide the retail user with substantial reductions in his bad debt, elimination of fraud, and the ability to significantly increase his base of credit card users.

Other areas of point-of-sale have developed less rapidly. The big three in retailing have derived some benefit from cash-register-like terminals equipped to input data to local store batch processing systems.

The pioneers in this area are undoubtedly enjoying significant benefits for local store managements. These systems, unlike the credit systems, have not provided an interconnected data network which permits overall systems applications such as credit authorization, inventory control, management information and systems implementation.

A few stores are now beginning to add point-of-sale terminals and other types of terminals to their credit networks such as CRT, output printer and teletype units which are required in an overall management information network. These tend to be highly specialized systems tailored to the individual retailer's operating requirements, reflecting in many ways those things that are unique to that retailer's operating system.

Clerk keys in charge account number and dollar amount to get instant credit authorization on the Regitel credit terminal.

Customer makes a credit purchase (without a phone call credit check) and the entire transaction takes less than 20 seconds.

On the other hand, automatic reading of merchandise tickets, which holds great promise for the future of retail store operations, has yet to demonstrate economic advantages in actual store operations. This is largely because the economic feasibility of automatic ticket reading is almost entirely dependent upon the conversion of the entire retail store operation, which no retailer has been able to accomplish to date. There is no doubt that ticket reading will provide one of the most important financial advantages in future point-of-sale systems.

Merchandise Marking

Numerous different merchandise marking techniques are under development. Included among these are print-punch, magnetic tickets, optical bar codes and optical fonts, most of which are designed to be read by a wand-type device while the merchandise ticket remains affixed to the merchandise.

Standards committees are studying the various technologies for merchandise marking; however, in the long term it is probable a number of different marking technologies will be employed.

It would appear that the specialized system which is evolutionary in nature will be the dominant system of the future. Fundamental to this system, which is better suited to the larger general merchandise user, will be a sound communications subsystem interconnecting all input and output terminals in a real-time network. Secondary operations such as off-line batch processing, data gathering and store-and-forward communications will supplement this system.

In time, the smaller general merchandise users can be expected to benefit from these kinds of systems on the basis of participation in a utility type of data processing operation.

Food for Thought

In the food sector of retailing in the last several years there have been a number of system developments. As was true in the non-food sector, many of the pioneers have been unsuccessful and are no longer on the scene. Presently there are approximately five major companies which have introduced and are selling food systems.

The food systems do not have the advantage of a quick cost justification such as credit system savings or the individual batch processing management information that spurred the development of point-of-sale operations in the general merchandising sector of retailing. There are, however, some significant advantages to be gained if, in the food sector, the problems of check cashing, store ordering, merchandise re-marking and checkout stand throughput can be solved.

Check-cashing systems have developed along with the credit authorization systems, and the state-of-the-art is such that in many states where the consumer uses the supermarket as a check-cashing agency, the benefits of check authorization systems could be significant. The throughput problem in the checkout stand is largely a matter of materials handling and will yield more to that

(Continued on Page 33)

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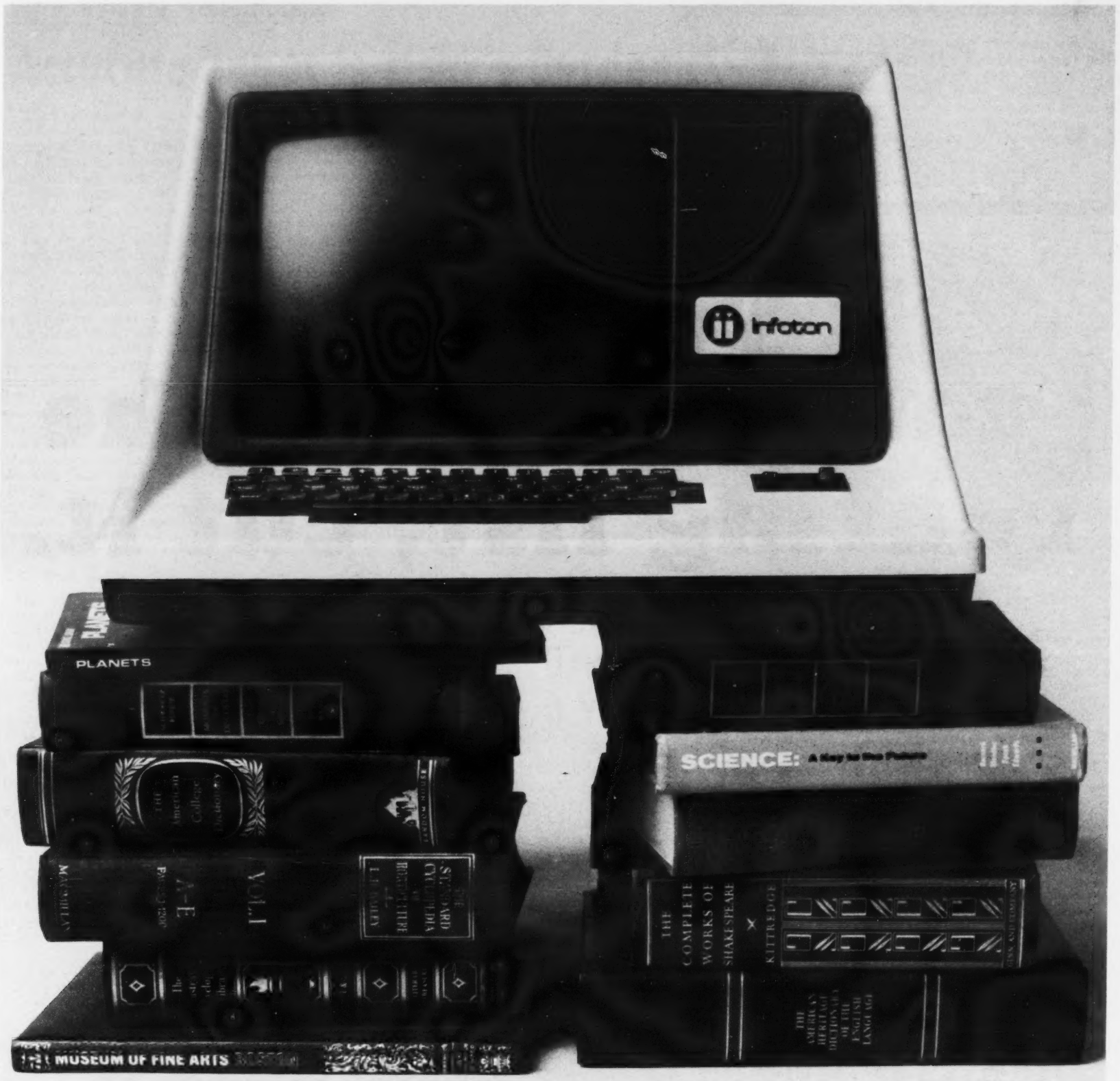

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With Remote Terminals...

Accurate Input Is User's Burden

DALLAS – One of the major questions to be answered when a company gives up keypunches for terminal input is who will be responsible for data entry?

At Sam P. Wallace, one of the world's largest mechanical contracting companies, each originating office or department is totally responsible for the validity of the data entered into the firm's Honeywell 2200.

"The responsibility for the integrity of the data rests entirely with the end user," said DP manager Mike O'Donnell. "We retain only the responsibility for accurate processing."

By eliminating keypunches and switching to remote terminals, the DP operation now has much more respect from other departments within the firm. And inaccurate data occurs much less frequently; each department realizes it is totally responsible for any incorrect information which is input to the central data processing file.

Formats Standardized

The decentralized data entry concept does require control by the DP department, O'Donnell said. Data formats must be standardized and job scheduling must be coordinated to allow for priority runs.

During normal operations, the central site polls each remote terminal at night after business hours using Wats lines. The firm uses Sycor terminals on dial-up lines operating at 1,200 bit/sec with Bell 202C data sets. The company may switch to another modem supplier but a decision has not yet been made.

Included in the DP workload handled by the HIS mainframe and the remote terminals are approximately 100,000 transactions/mo, and a $20 million annual payroll. In order to maintain control over data input formats, a continually updated manual is issued to the remote sites which include six regional profit centers.

Training of new operators is usually accomplished "in a few hours," regardless of the operator's starting skill, O'Donnell said. Although the input system is not on-line, the 2200 can turn a job around on short notice when necessary.

When a priority run is needed, a complete job quote on a mechanical contracting job can be provided in several hours, the user said, following the estimator's work. This same procedure previously took several weeks with manual methods.

Normally the terminals store their input data on cassettes which are then polled at night and transmitted unattended in batch mode. At the central site, the data is collected onto 7-track tape in a format compatible with the mainframe.

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POS Revolution Still Years Away

(Continued from Page 30)

technology than to electronics.

In the food sector of retailing, the food industry's newly adopted Universal Product Code has the potential to provide a solution to the merchandise remarking problem, as well as offering a means for automatic scanning of merchandise passing through the checkout stand.

Gradual Development

In summary, the advent of point-of-sale will develop gradually in a specialized way with a number of different companies participating in different sectors of the market. Some of the major sectors would appear to be:

- The big three in retailing
- Major full-line department stores
- Other department stores
- Specialty stores
- The supermarkets
- The chains
- "Down-the-street" locations.

The requirements for specialization in equipment, software, sales force and service are such that these markets will develop along lines particularly suited to different vendors. It is doubtful that one large vendor will be successful in supplying a general-purpose type of solution to these varied markets.

Evan Ragland is president of American Regitel Corp., San Carlos, Calif., a supplier of point-of-sale systems to more than 15 department store chains.

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Remote Key-to-Disk Stations Simplify Hospital's Work

KANSAS CITY, Kansas – To achieve the benefits of source data capture, the University of Kansas Medical Center is making novel use of a key-to-disk data entry system.

Installed and operating for over two-and-a-half years, the system is required to run 24 hours per day.

Three of the system's eight keystations are operating at locations up to 1,040 feet away from the data processing room to handle hospital admissions, dietary and general accounting and research accounting functions. The remaining five stations perform routine data entry in the central area.

Whether assigned to remote or central locations, operators at each Inforex keystation independently enter data by cable directly into a shared processing and control unit. Data is stored on a disk and automatically pooled and verified before being transferred periodically onto magnetic tape for processing in the main computer.

Planners at the medical center dispersed their keystations for several reasons. Most obviously, the move simplifies data entry by eliminating one step in the process. Data formerly had to be transferred from a manually originated document to a formatted document preparatory to keypunching, then actually keyed onto cards; now the data is keyed directly into the system from the original document. Not only is time saved, but the chance of error is reduced.

> *"By letting specialists at dispersed stations enter data directly into the system, we get them more involved in end results . . . which leads to greater accuracy . . . Equally important, we're getting time-critical reports quickly with fewer man-hours expended – not by faster keying as such, but through a more streamlined system." – Douglas Josephenson, Manager of Operations, University of Kansas Medical Center*

The amount and type of knowledge for efficient management also came into consideration in deciding whether to disperse keystations at the center. Clerks for admissions, dietary or accounting functions are concerned and familiar with their specialities rather than data processing. They can detect problems which may occur right at the source. Yet, these clerks need only know how to type in order to learn to use the system. By contrast, operators at the DP department's key-to-disk stations are generally former keypunch operators.

Finally, psychology is involved in source data capture. As Douglas Josephenson, manager of operations at the medical center observed: "By letting specialists at dispersed stations enter data directly into the system, we get them more involved in end results rather than just their own specific function. They develop a greater interest and feeling of responsibility, which leads to greater accuracy and validity of input.

"Equally important, we're getting time-critical reports quickly with fewer man-hours expended – not by faster keying as such, but through a more streamlined system."

Other Methods Evaluated

Before installing the Inforex system, the University of Kansas Medical Center investigated other possible replacements for its non-buffered keypunch units. It conducted a thorough analysis of the whole range of data preparation methods in cooperation with other state agencies. In particular, the center received permission from the state to evaluate both key-to-disk and buffered keypunch units, although the study also included a review of key-to-tape units.

Key-to-disk station in the dietary department processes menu data for all patient meals.

Whatever the method chosen, the center's analysts wanted some manner of display for visual verification of data input. The eight-station Inforex system appeared to be the least expensive key-to-disk system with such a display capability.

The medical center regards the move to key-to-disk data preparation as a progressive step. According to David Myers, systems coordinator: "Our Inforex system is creating an atmosphere of greater timeliness, especially in the admissions and dietary areas. The CRT display figures largely into this, giving a feeling of interaction with the processing system."

Robert Sheridan, director of computer services, described in detail some of the applications of the Inforex system that have been in operation for the past two years:

Admissions – Recording admissions, discharges and transfers (ADT) is a round-the-clock, seven-day requirement which formerly called for full two-shift keypunching operation on weekends as well as during the week. Replacing this with a single key-to-disk station at the front door of the hospital eliminated an extra clerical step and reduced the ADT error rate immediately from 10% to 5%.

Part of this improvement is attributed to the CRT display. One of these is mounted on each keystation and permits the operator to verify visually each record as it is progressively keyed. Data is transferred from disk to tape three times a day to maintain files current within three hours.

Dietary – Preparing individualized menus for up to 600 patients on a variety of special diets is a daily function which used to occupy three clerks tallying information from order slips filled out for each patient. An interim keypunching

(Continued on Page 38)

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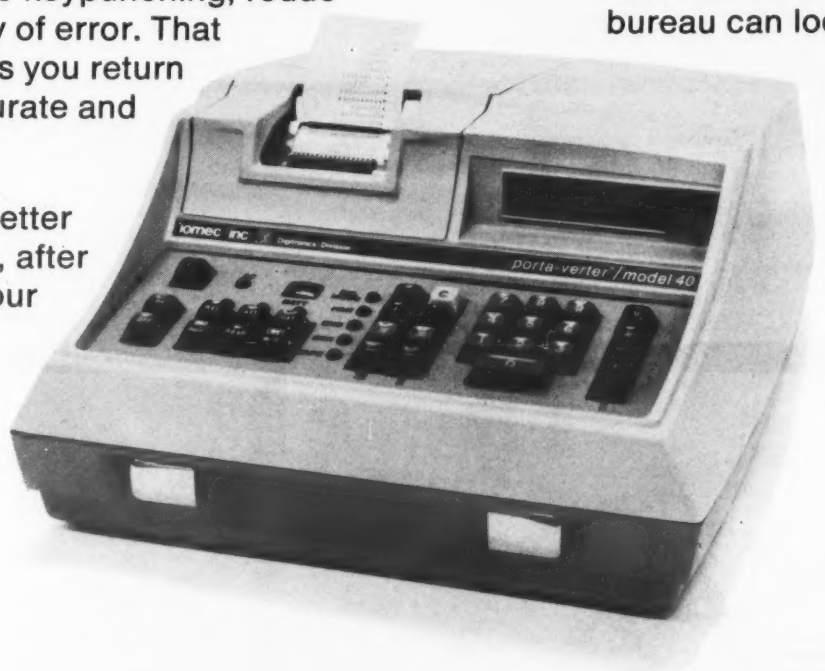

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Shared processing and control unit of medical center's key-to-disk system provides automatic pooling of data from individual stations.

Remote Key-to-Disk Eases Hospital Jobs

(Continued from Page 36)

operation from 6:30 a.m. to 8:00 p.m. took over tabulation of menu quantities for lunch and dinner but breakfast and weekend dinner meals were still handled manually.

A single key-to-disk station in the dietary department on the fourth floor now operates between 6:30 a.m. and 4:00 p.m. every day to process menu data for all meals.

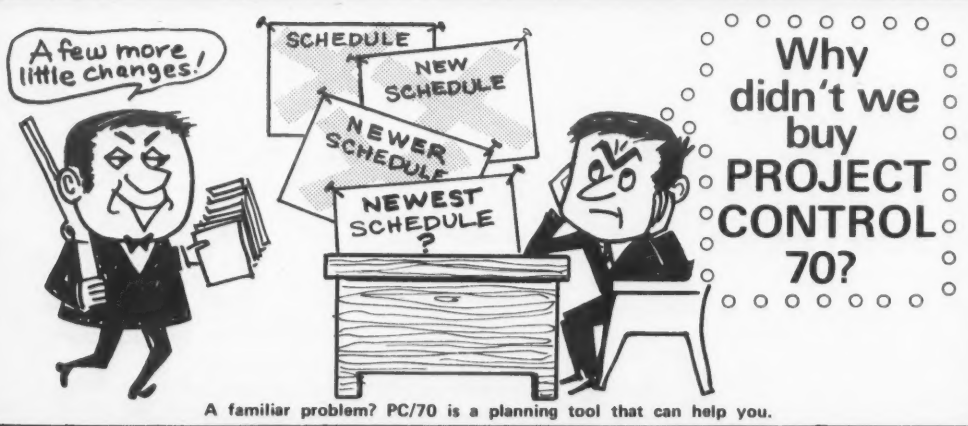
General and Research Accounting – Another single key-to-disk station in the accounting department prepares data for billing, purchase orders, accounts payable, travel vouchers, etc., as well as for administration of various research funds. Processing of these functions has been segregated for closer control of files. This station accounts for 13,000-15.000 transactions per month.

Centralized Data Entry – The remaining five key-to-disk stations are centrally located in the data processing area and prepare data involving some 5,000 patient charges daily. In switching from the previous keypunching operation, the medical center realized an immediate reduction in error rate from 8%-10% down to 2-1/2%; this has dropped even further to less than .05% following familiarization with the Inforex system.

"As far as projections are concerned, there's no reason, for instance, why we couldn't use the same data we now have for daily dietary purposes to maintain a more up-to-date inventory control and ordering system," Myers said.

In working towards this goal, the center has proposed to move another keystation into general stores. Data capture from that decentralized location would represent a major step toward more timely inventory control.

The center is also planning to upgrade its data entry capability by moving to the Inforex System 1302 with up to 16 keystations. In addition, other applications are being considered to capture data at its source.



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CPU Reads Palms for Security

NEW YORK – Employees at a toy company in Brooklyn cannot report to their jobs unless they allow a computer-based security system to "read" their palms.

Instead of punching in with a conventional time card, workers at My Toy Corp. insert a plastic card into the slot of an Identimat security station equipped with a palm-scanning detector on the top surface. The scanner compares the prerecorded data on the ID card with palm characteristics being scanned and either recognizes the employee or identifies him as a non-authorized person.

The palm-reading system is made by Identimation Corp., Northvale, N.J. The company has developed an encoder which can create an "authorized hand signature" based on four physical characteristics: finger length, curvature at the finger tip, skin translucency between fingers and hand deformation caused by depressing the palm onto a flat surface.

These four characteristics are combined to develop a "hand geometry measurement," according to Larry Dolan, vice-president for marketing at Identimation.

Employee inserts identification card and puts his palm on identification unit at the My Toy Corp. in Brooklyn, N.Y. The unit verifies that the person is authorized to enter the area and notes starting and leaving times for payroll purposes.

In order to gather sufficient data to develop an authorized hand signature, an employee must depress his palm against the system scanner four times. The averages of the four hand characteristics are then combined to come up with a typical handprint for the employee. By taking an average of several prints, the system allows for variations caused by such factors as weight changes, swelling, cuts, etc., according to Dolan.

This data is then encoded onto a magnetic stripe format and put on the plastic card together with the employee's identification number.

When an employee at My Toy is "passed" by the Identimat, the worker's number and starting time are automatically entered into a Nova 1200 mini which also records the time the worker ends his shift and totals his weekly hours for payroll purposes.

At the toy company, the system is designed to prevent employees from being punched in or out by their fellow workers, but Dolan sees other applications for the system where access has to be limited.

Several potential customers are exploring the palmreading system for use at DP installations where security is critical and access is limited.

The palmprint data is recorded on the plastic cards in a 36-bit word that can be arranged in almost any sequence so that even with an encoder device, it would be virtually impossible to decode the data on the magnetic stripe, Dolan said.

The Identimat system has also been interfaced with a DEC PDP-15 and IBM mainframes and other interfaces could be developed, Dolan said. The palm-scanning stations can operate either hardwired in local mode or remotely over telephone lines. The hand signature data is transmitted in Ascii format and the stations can be interfaced on an EIA level, Dolan said. Other code interfaces for Ebcdic, BSC, etc. could be developed, he said.

A typical system with one scanning station costs about $3,300 and an encoder is priced between $2,000 and $4,000. The system can be leased for about $25 per $1,000 of purchase cost per month, he estimated.

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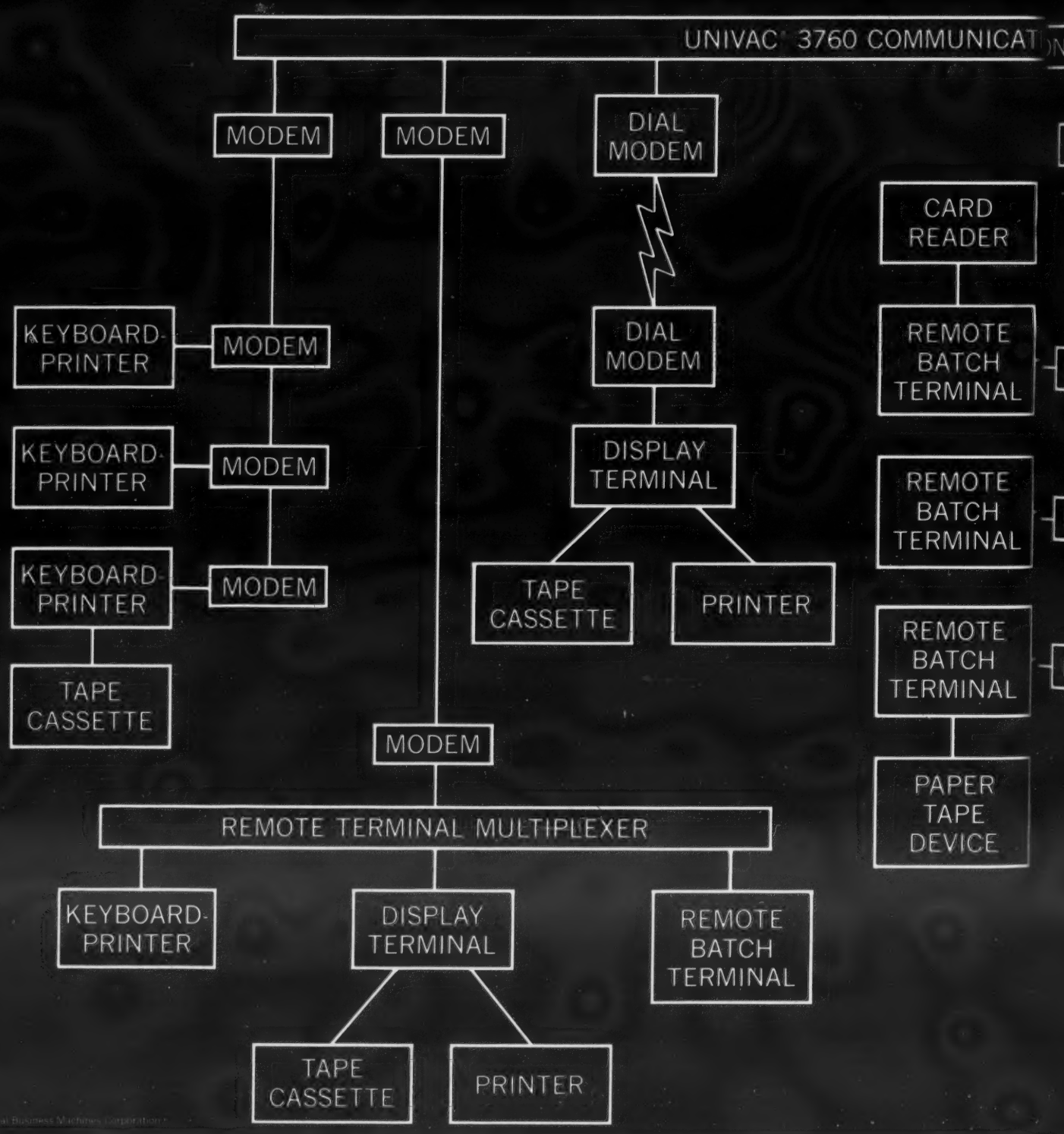

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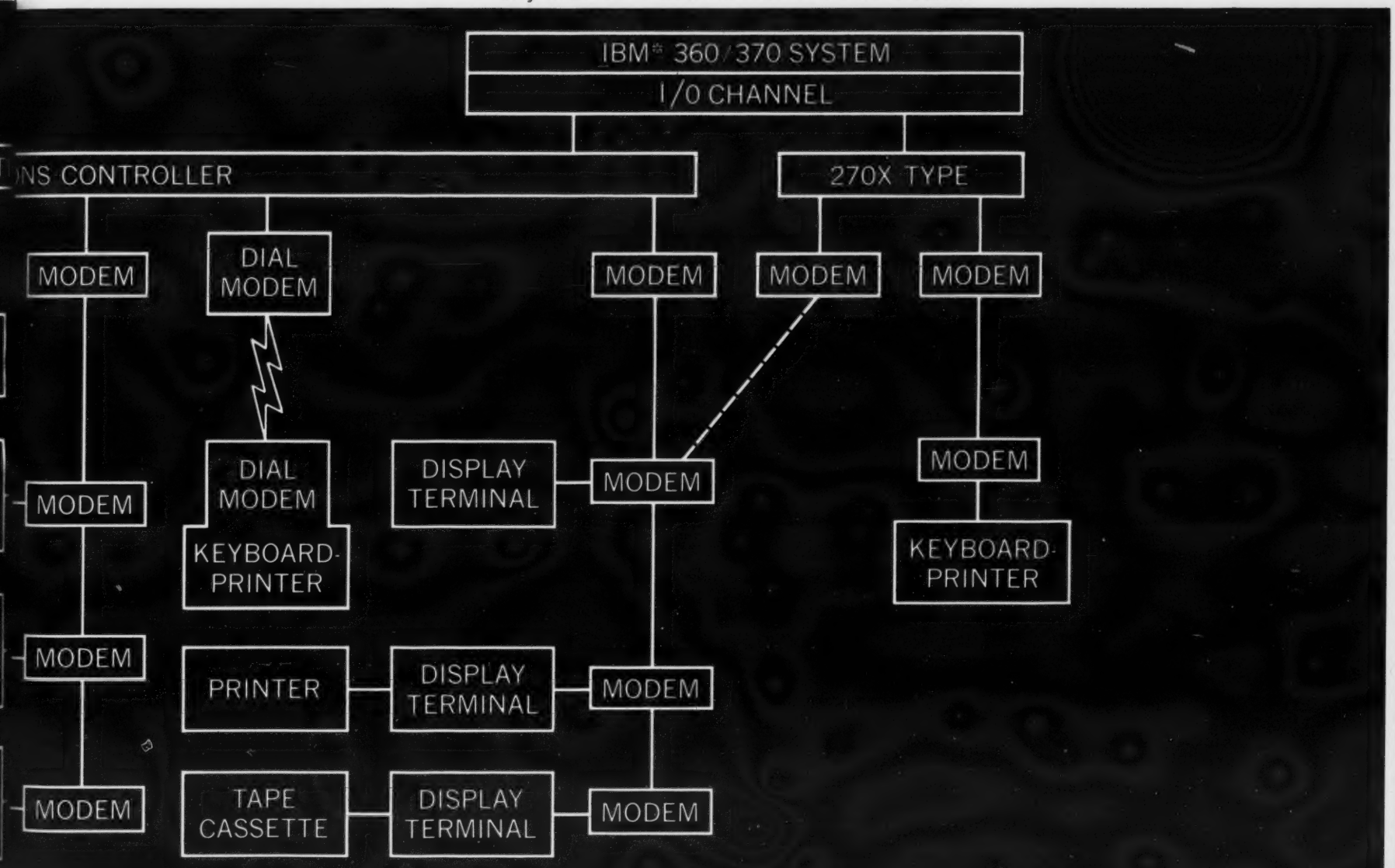

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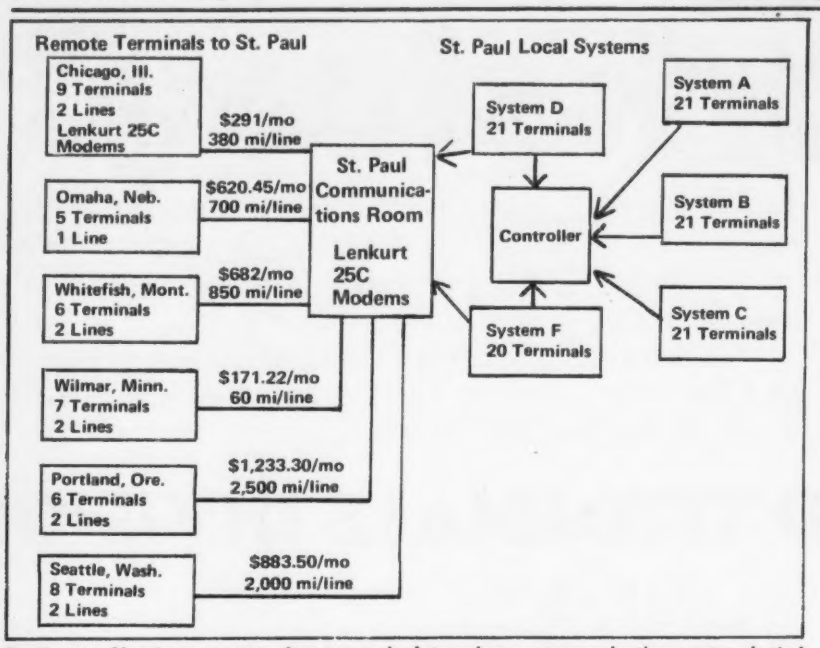

Burlington Northern remote sites transmit data using a communications network tied to the central DP site. Local systems also share these facilities.

Railroad Tried Assorted Units, Found Happiness With Key-Disk

By Patrick Ward
Of the CW Staff

ST. PAUL, Minn. – In 1970, Burlington Northern railroad found itself with an assortment of key entry equipment and a data preparation operation that urgently needed to be improved. The company had IBM 026s and 029s, Mohawk key-to-tape units, Univac 90-column punches and Univac 1701-1710s, and an equipment upgrade was needed.

Scanning was tried, but the firm's mainframe was not handling it well enough, said Harry Coolidge, assistant director, data production.

"We needed some way of speeding up our keying," Coolidge added. "Because of a recent merger we had a very great turnover in our personnel, and we had to have some way of improving keying accuracy," he said.

The railroad's solution was to go to key-to-disk using leased General Computer Systems (GCS) CRT terminals controlled by minicomputers.

This method offered quick data entry, but "we also did it because we felt the edits that we were able to build into the minis would stop many of the errors before the CPU accepted the work," Coolidge said.

Several Systems Considered

Burlington Northern considered Inforex, CMC, Honeywell and Mohawk systems before choosing GCS. Coolidge explained the choice:

"GCS had the ability for us to start small and build up. And it had the ability to put on more core and disk than any of the others. It also was the only one that had a decent communications-type operation that we could afford," he said.

The remote stations in Seattle, Wash., Omaha, Neb., Portland, Ore., Whitefish, Mont., and other locations average between five and nine terminals and transmit over Bell lines or over the railroad's own microwave lines to St. Paul. There are two GCS 216 minis which split control of the 41 remote terminals between them.

"All the edits are built into the GCS computers, and we are controlling them through a supervisor station here, so it's as if we're keying right in our own room," Coolidge remarked.

Presently the remote locations are keying in a 46,000-man general payroll twice a month. They also handle business expenses, material accounting in some locations, and similar jobs, he said.

Three other minis handle 62 terminals in the St. Paul headquarters. These terminals handle statistical work, office payrolls, business expenses, and customer, revenue and freight accounting.

"We are keying from waybills, IBM printer lists, program forms, almost anything," Coolidge said.

Reluctant At First

"I fought the CRTs because I thought the girls would be looking at them and slowing down, but I found just the opposite," he said. "Most of the girls turn down the CRT picture so they can't see it anyway. They don't look at it. Those girls know when they make a mistake."

There has been a great error reduction with the new system, he claimed, and that is one reason for lower costs.

"We will feed figures into the minicomputer in advance of what an operator's batch total must balance back to," he said. Thus the operator notices an error before it leaves her, "and all she has to do is key over.

"If it's a balancing error, the keyboard will lock up," Coolidge added.

Burlington Northern also put on a check system for employee numbers, which had previously been a big source of errors.

The result is that "we have knocked out about 90% of our verification," he said, with substantial personnel savings.

The key-to-disk system has pleased the operators in that the CRTs need such a light touch and are noiseless, in striking contrast to the old Univac 1710s. Operator fatigue has gone down, he added.

Beyond this, the new system adds some job enrichment. For operators, work is no longer "just going along and hitting some keys and reading some numbers, but you also think what happens afterwards." He mentioned calling up a program and checking on balancing as two things that now involve operators.

"I think we saved more than we expected" with the GCS system, Coolidge commented, "not only through some personnel reduction, but also in the field.

"We used to have 1710s and 1701s and 029s and . . . sorters, and occasionally 402s to do processing. We also had a DCT 2000 for transmitting data.

All of this has been eliminated for about a $1,500 savings.

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Not Merely Keyboard Replacement

OCR Economically Justified for Volume Data Entry

By Conrad A. Strelau
Special to Computerworld

Much has been written about why Optical Character Recognition (OCR) and Optical Mark Recognition (OMR) devices have not displaced large numbers of key entry devices as predicted by early forecasters.

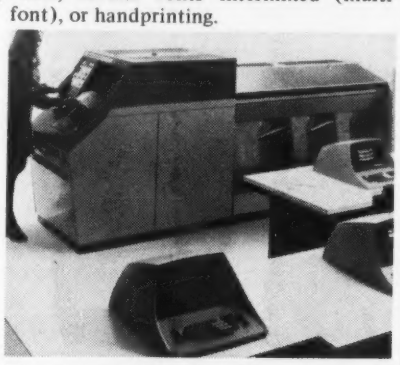
Many times the justification for installing an OCR system is not the displacement of key-type devices, but economic justification based on the data entry volume and the user's system requirements. On many occasions, OCR is the only valid solution to this increasing data processing bottleneck – data entry.

Recently, there has been an increasing trend in the use of OCR for this and other viable applications, and it appears that this trend will continue into the foreseeable future.

Overall, the applications that can be addressed by OCR systems can be divided into three broad classes: data entry, transaction processing and terminals.

Data Captured Optically

For the most part, data entry applications are concerned with the capture of data from sheets or pages where many lines are read. The data that is being captured optically can be from a single machine-printed font, several separate fonts, several fonts intermixed (multi-font), or handprinting.



The Recognition Equipment Input 80 page-reading system can handle up to 3,600 char./sec. Rejected pages that cannot be scanned are corrected on the Total entry system shown in front.

When captured, the data is recognized electronically, verified, digitized, and output in a computer format that readily interfaces into the user's downline EDP system. Thus, from a typical document, data is converted in one step directly into a form that can be fed into the computer system for processing.

In most real-world applications, data is prepared that is not always readable by an OCR system. This data must also be captured and converted into a computer-compatible form for downline processing. Thus, the overall data entry system, to be viable, must have the capability to handle a wide range of mixed data (that is, data which is untyped, partially typed or badly degraded).

In addition to contextual display of characters, words or fields on CRT terminals, these auxiliary systems must have the capability of displaying video images of rejected characters for recognition and insertion into the data field by keying. Total data entry systems with this capability are available today from several manufacturers.

The pricing of OCR systems for data entry applications depends primarily on the complexity of the applications, volume of data to be processed and unique operating requirements of the user. Data entry applications are found primarily in the insurance, government, health care, retail and automotive industries. OCR systems handling these applications are currently installed worldwide.

Unit-Size Documents Processed

Perhaps the largest single OCR application class with respect to document volume processed is that of transaction processing. This is essentially the optical reading of one or two lines of data from unit size documents (e.g., credit card invoices). This data may be in any OCR-readable font.

The vast majority of the data read in this class is imprinted carbon impressions from source documents that are manually handled extensively before being OCR read and processed at EDP centers. After being read optically, these documents are sorted under program control at very high speeds into sets for customer billing purposes. OCR transports used for this purpose handle documents ranging in weight from tissue (airline tickets) to card stock (credit cards) at speeds up to 2,400 document/min.

Transaction processing OCR applications are found primarily in the airline, banking, credit card and government industry segments. As with data entry, the growth of OCR in these industry segments is increasing annually, with banking applications adding the most impetus at this time.

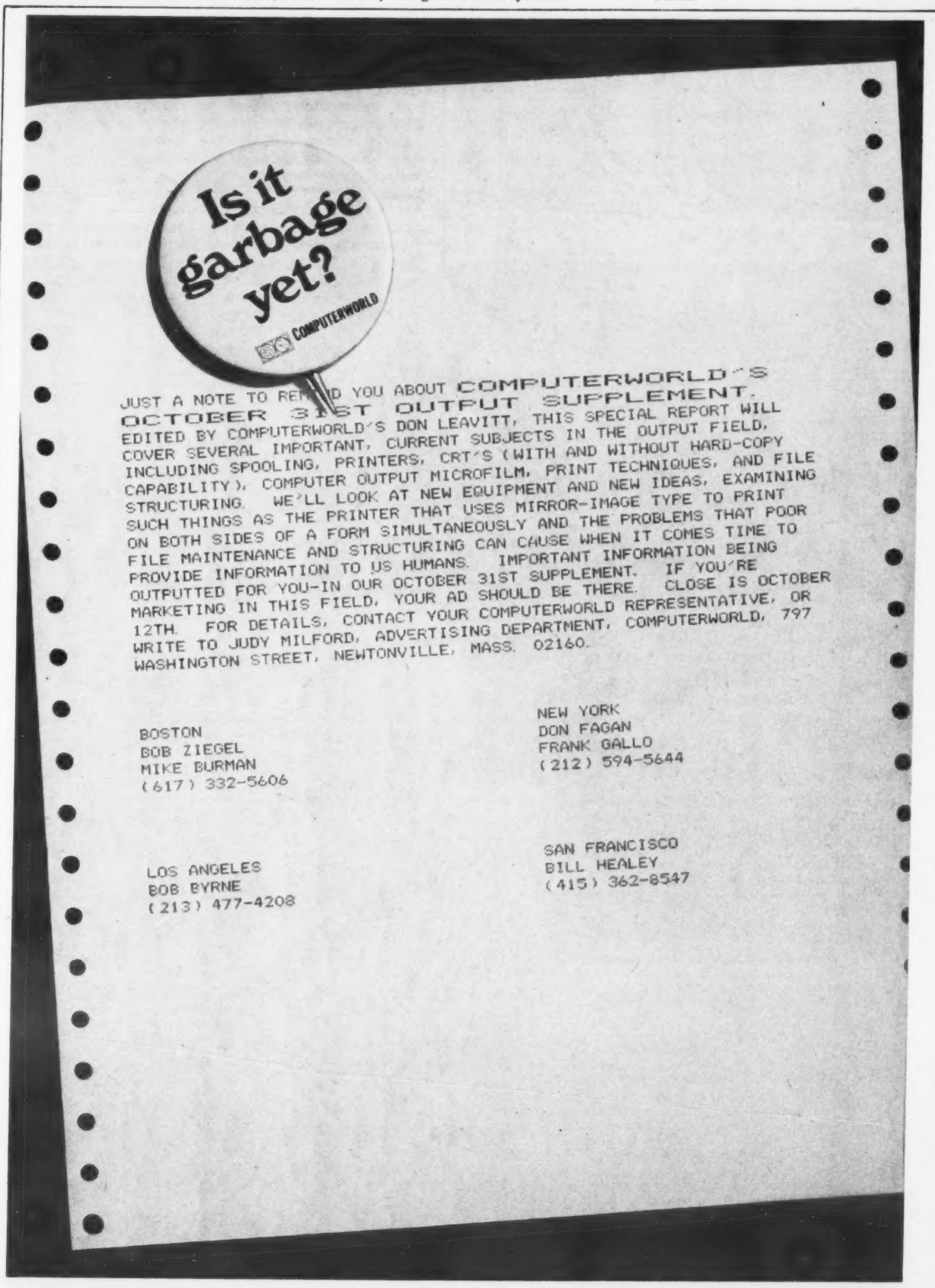
Transaction processing systems for bank check processing have the ability to read both optically and magnetically. These systems also have the capability to endorse, cancel, individually number documents for Positive Item Control (PIC), bar code for further fine sorting, microfilm, and sort documents into any one of 24 stacker pockets at rates between 1,800 and 2,400 document/min, without degradation to the reading or paper handling performance of the system.

The pricing for transaction processing systems is totally dependent on the user's applications and specifications. It is not uncommon for large users to project savings in excess of one million dollars annually over present methods of data capture by using such OCR systems.

A third class of applications suitable for OCR devices can be broadly classified as terminal systems. This class encompasses systems which incorporate point-of-sale (POS) devices, hand-held scanners and table-top remote readers. Although this is a relatively new series of applications, the early results indicate that these applications will be successful and are economically justified. Terminal applications are found primarily in the retail, manufacturing and distribution industries.

The OCR industry is a dynamic and highly technological industry where advances in applications, hardware and software are reflected in new and more efficient systems. These offer the user better methods of preparing data for electronic data processing.

Conrad A. Strelau is senior vice-president of Recognition Equipment Inc., Dallas, Texas.



TRW's 'Validata' Helps Catch Credit Card Swindlers

LOS ANGELES – Between 50 and 75 potential airline passengers or car rental customers each day fail to make it to their plane or car. They are not accident victims. Instead they are victims of a national credit validation system that has caught them attempting to complete a fraudulent credit transaction.

Known as TRW Validata, the system is operated on a service basis by TRW Data Systems Inc., Hawthorne, Calif. for 15 subscribers. Included are airlines, three car rental firms and one motel chain.

The heart of Validata is a data base of about 850,000 records on stolen or misused credit cards, lost or stolen airline tickets, and bad checks.

The data base is stored on a Diablo disk subsystem which operates with dual 32K Data General Nova 1200 minicomputers. The minis are connected through private line telephone facilities to 27 metropolitan areas.

The network operates with one mini on-line and the second kept as back-up in case of equipment malfunction. The system transmits data in a special four-bit Comcode developed by TRW that is said to be twice as fast as Ascii.

Credit inquiries are entered on special Validata terminals, which can be installed up to 2,000 feet from a communications interface at ticket counters.

How It Works

When a customer at a typical airline wants to charge the cost of his ticket, the Validata system comes into play. According to Rheinhold Friedhoff, Lufthansa manager for North and Central America, "If the passenger wants to pay for a ticket in any way other than cash, the agent enters the appropriate check, ticket or credit card number on the small keyboard.

"Within a few seconds, an approval message from the computer flashes on the screen – or the agent is advised to phone the TRW Validata Center, for further verification," he explained.

Additionally, the system reveals the number of transactions the customer has made within the past several days. If that number is high, the transaction may be suspect and the card will have to be verified.

The Validata terminals include an eight-digit display, 64-character buffer, and a 16-character keyboard with four function keys. Each terminal is polled several times per minute and a typical inquiry contains about 20 characters.

The data base stored in the Validata DP system contains input on stolen credit cards and other bad account information. The Validata DP center is in constant touch with credit issuing agencies such as American Express. Some of the bad account information is sent to TRW in the form of biweekly magnetic tape updates, and the center also maintains TWX terminal connections for daily changes.

The Validata subscribers pay for use of the system according to the number of transactions which they initiate. Charges range from two cents for an inquiry to verify the validity of an airline ticket to eight cents for an inquiry about a personal check. An inquiry on a credit card account costs five cents. All inquiries are handled strictly by account number so that the names of credit holders are never available to Validata personnel.

Passengers at Lufthansa Airlines purchase tickets using credit cards that are verified on TRW's Validata system.

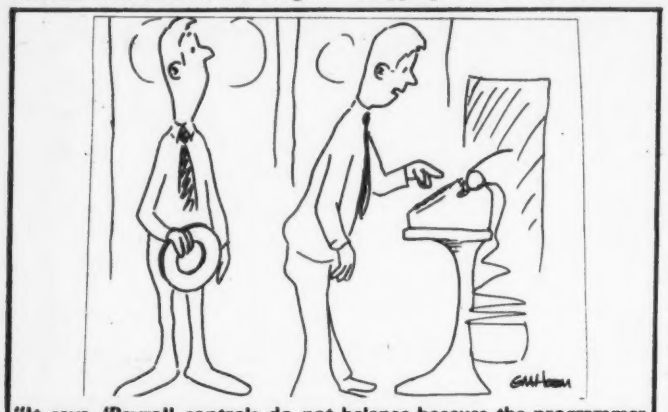
The average hit on the system is worth at least $1,000 and often more in potential credit losses, according to subscribers. Each stolen airline ticket that is found through Validata averages about $260. There is no good estimate of how much the Validata system has saved the airlines, but in 1970 before the system began operations, the air carriers lost about $40 million in bad credit cards, stolen tickets, and bad checks. The system has helped to considerably reduce this figure.

Although primarily oriented to the airline industry, Validata is being tested in a department store environment on the West Coast and expansion into supermarkets is also being considered.

The Validata network is being expanded with concentrators and the network currently includes about 600 terminals operating on about 80 interfaces.

One of the side benefits of the system is that it has actually served as a deterrent to the initiation of fradulent transactions in many cases. Airline observers often note that a potential customer waiting at a ticket counter will see the Validata terminal being used and leave. Although it is difficult to prove, many of these may have intended to attempt a fraudulent credit transaction, according to TRW.

The average subscriber estimates that the savings resulting from the Validata system equals about five times the cost of using the terminals, a TRW spokesman said.



"It says, 'Payroll controls do not balance because the programmer took off for Spain with the checks'!"

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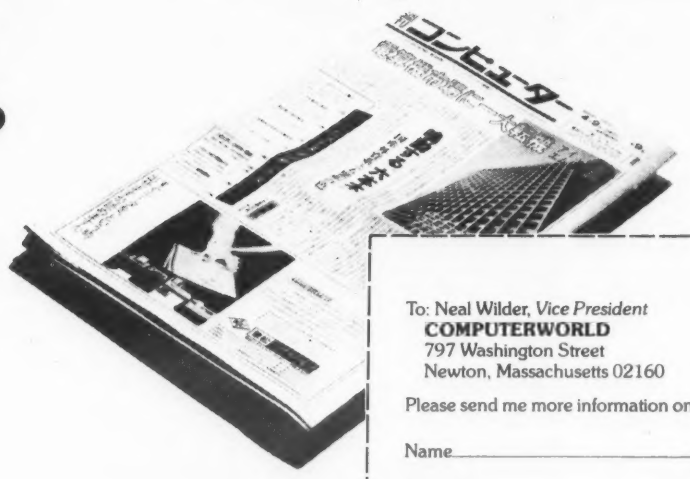

In Japanese it's called *Shukan Computer*, and in English, it means "Computer Weekly." Whatever you call it, *Computerworld's* new sister publication is an excellent vehicle for selling EDP products and services in the large and expanding Japanese EDP market. Here are some of the reasons why:

- **Shukan Computer** is a joint venture of *Computerworld* and Dempa Publications, the leading Japanese publisher of electronics information services. With the combined resources of the two companies, Shukan has the largest news gathering organization of its kind in the world.
- **Shukan Computer** is the only newsweekly for the fast-growing Japanese computer community.
- Initial circulation is guaranteed at 35,000, divided about 80% to end-users and 20% to the computer industry. Circulation development methods currently under way are the same as those which gave *Computerworld* the highest paid circulation in its field in less than four years.
- **Shukan** lets you in on the action in the world's fastest growing EDP market. The Japanese Ministry of International Trade and Industry (MITI) has made the following 1976 forecast: 39,000 general-purpose systems installed, up from 11,237 in 1971; 11,000 minicomputers installed, up from 1,670 in 1971; and 3,000 industrial systems installed, up from 1,086 in 1971.
- Is this growth likely? The latest census of general-purpose systems revealed that there were 14,806 systems installed as of September 1972, a one-year gain of 3,569 units and $911 million installed value, a growth of 31.7% and 23.1% respectively. And more than 50% of these new systems were American made.
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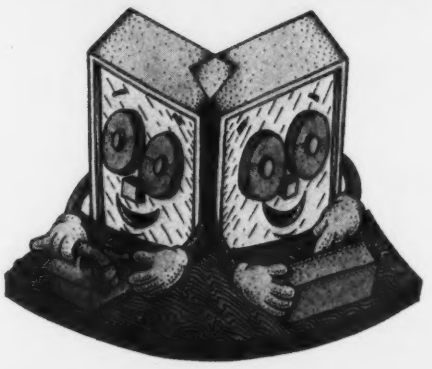

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Efficiency at What Price?

Greatest Danger to Small User May Be Upgrades

By Michael Weinstein
Of the CW Staff

Small system users many times run the most cost-effective and efficient computer systems. Yet this may all change in the name of higher efficiency, bigger systems and the benefits from entering the exciting world of JCL.

ANALYSIS

The danger of these promises is in attacking the basic reason for the success of many small systems: by being small these users can have a better combined grasp of the objectives of their companies and the operations of their computer.

The small system user's computer is generally simple enough so persons who run the company can also run the computer. In many cases the officers of small companies also write the programs.

The small system is like any piece of working equipment; it must bring in more money than is shipped out in the form of rental – it must be directly cost justifiable.

Hard Life

Life is not simple in large companies and their larger systems. A great deal of system effort is expended just to perform administrative tasks needed to keep track of employees and products so numerous they have become numbers.

Further, in large companies the general rule is to have management filter its work through tiers of computer professionals who translate management needs to and from the computer.

While this is necessary due to size and complexity of both large companies and large systems, it creates longer lines of communications between the objective and the practice of computer operations.

Despite the different operational needs of the small and larger user, there is a move under way to upgrade the small user from his System/3s, NCR 50s, etc., to the larger, faster, more complex, costlier computers.

Spokesmen for the move are vendors who argue for better technologies and

The Small Systems User

some from within the ranks of the small system users who take up the cry for the riches of higher-level languages and operating systems.

Two Prime Examples

IBM has introduced the 370/115 and 370/125 as potential upgrade machines with the promise of "virtual memory" and its implication of something for nothing.

As for moving to the wonderful world of the 370s, not only is it highly questionable that there is any value in a virtual computer with 98K bytes of real memory, but the degree of complexity of operation increases markedly. It is not clear that the small user really wants to keep abreast of the latest DOS/VS release.

On another front, a recent controversy in the Letters to the Editor section of *Computerworld* dealt with the comparative merits of Cobol and RPG.

The point is not whether Cobol is superior to RPG, the real question is whether it is a better vehicle to make the computer pay its own way.

Cobol probably is a better programming language, but it is also harder to code. Its implementation may mean the insertion of a full-time programmer between the user and his machine.

But despite these and other valid reasons, the move toward bigger and more complex systems in the name of higher promised efficiency may be successful.

The small users are scattered throughout the country and view themselves primarily as shoemakers, or importers or manufacturers first and as members of the computer profession a distant second.

The small user has no unified voice and is largely overlooked by the large associations such as ACM which themselves are enamored of the bigger and better concept.

Who Wants to Join?

There are groups that exist solely for the small system user, but many users do not see the need to join.

This isolated bliss may someday change very drastically – for example, when and if IBM decides to stop support of RPG or comes out with some new technology that is both demonstratably superior and tied to upgrading to a new generation of coputers.

Small User Builds Meat Processing Turnkey System

HAYWARD, Calif. – Most small computer users take a general-purpose system, apply it to their own business's needs and stop there. Jess Sirianni went one step further and turned his DP efforts into a paying business.

Sirianni understood the meat packing industry and felt the essential ingredient for success was the ability to have quick and accurate supply and demand information coupled with the ability to react quickly to ever-changing government audits of prices and profits.

The obvious tool to obtain this efficiency was the small business system, he felt. But the builders of small systems only understood computers; they had little knowledge of meat packing.

Thus, Sirianni effected a marriage between himself and Qantel Corp. with the first offspring being the Meat Information Management System (Mims).

Software Converted

Sirianni took the standard Qantel software and converted it with Qantel's help to perform specialized functions. Included in the new software is a program that tells the packer how much to charge for his meat to realize government-directed profit levels.

The total system runs on a Qantel/Answer central processor with 8K words (8-bit word) of memory. Peripherals include two tape drives, a 100 line/min printer and IBM 2741 Selectric typewriter terminal.

The entire system including software costs around $37,000 from Qantel at 3474 Investment Blvd., 94505.

If you have a voice in company training, you have a responsibility to ask yourself these questions:

1) *Is the cost effectiveness of your present training efforts acceptable?*
2) *Is it possible to put your internal and customer programs in multi-media format, thus decreasing training costs and insuring standardization?*
3) *Are you now conducting training programs but lack certain methods, materials or instructor talent?*
4) *Is there a gap between company goals and technical capabilities, i.e., need for updating skills in Data Base Management, Data Communications, Business Systems Analysis and Design, Virtual Storage, Project Management, etc.?*
5) *Is your in-house training capability providing the quality and productivity levels you require?*

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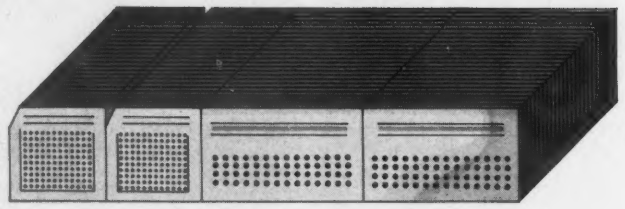

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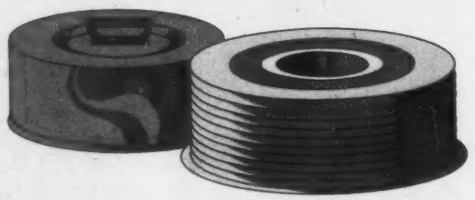

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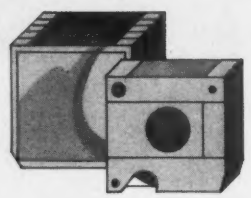

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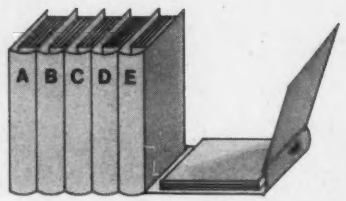

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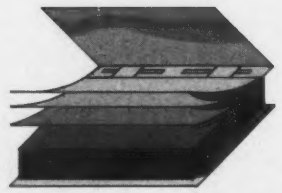
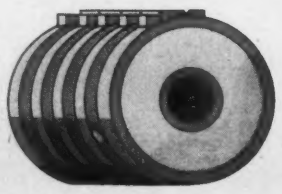
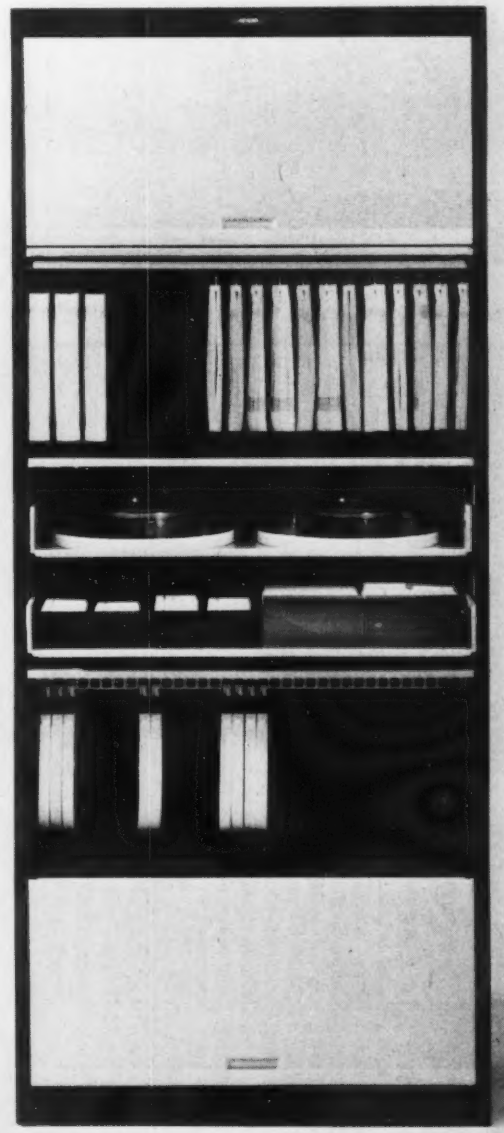


and one for tapes.





This one.

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Calendar

Oct. 1-3, Boston – **ACM Symposium on Principles of Programming Languages.** Contact: J.D. Ullman, Department of Electrical Engineering, Princeton University, Princeton, N.J. 08540.

Oct. 4, Ithaca, N.Y. – **American Records Management Association** seminar, "Challenge to Change." Contact: Richard Strassberg, 144 Ives Hall, Cornell University, Ithaca, N.Y. 14850.

Oct. 8-10, Iowa City – **SIAM-IMS 1973 Joint Fall Meeting.** Contact: Siam, 33 S. 17th St., Philadelphia, Pa. 19103.

Oct. 8-11, San Francisco – **Honeywell Users Group.** Contact: Robert Buckingham, Texas Easter Transmission Co., P.O. Box 1612, Shreveport, La. 71130.

Oct. 14-18, St. Louis – **Uaide,** "Why not COM?" Contact: Frank Henkel, P.O. Box 2449, San Diego, Calif. 92112.

Oct. 15-17, Iowa City – **Switching and Automata Theory Symposium,** sponsored by IEEE/CS and University of Iowa. Contact: Gerard Weeg, Computer Science Dept., University of Iowa, Iowa City, Iowa 52240.

Societies/ User Groups

Oct. 15-17, Yorktown Heights, N.Y. – **Fourth Symposium on Operating Systems Principles,** sponsored by ACM Sigops. Contact: Peter Weiner, Department of Computer Science, Dunham Lab, Yale University, New Haven, Conn. 06520.

Oct. 16-17, West Lafayette, Ind. – **Conference on Machine Processing of Remotely Sensed Data.** Contact: C.D. McGillem, Lab for Applications of Remote Sensing, Purdue University, W. Lafayette, Ind. 47907.

Oct. 17-19, Bermuda – **GCCA Seminar,** "Computers in the Printer-Publisher Relationship." Contact Nancy Harris, GCCA/PIA, 1730 N. Lynn St., Arlington, Va. 22209.

Oct. 18-19, Las Cruces, N.M. – **4th Annual Sicosim Symposium.** Contact: J.M. Mann, New Mexico State University, Computer Center, Box 3AT, Las Cruces, N.M. 88003.

Oct. 18-19, Ames, Iowa – **Computer Science and Statistics 7th Annual Symposium on the Interface,** cosponsored by ACM. Contact: William J. Kennedy, Department of Statistics, Iowa State University, Ames, Iowa 50010.

Future Trends Topic of HUG Fall Meeting

SAN FRANCISCO – A keynote address on "Future Trends in Data Processing" will kick off the Honeywell Users Group's (HUG) fall meeting, Oct. 8-11, at the Jack Tar Hotel here.

The four-day program will include parallel user workshops on MOD1, OS/2000, MOD4, MOD8 and Fortran.

Also on the agenda are parallel special interest sessions on manufacturing, distribution, scheduling and federal systems users.

Further information is available from Robert B. Buckingham, Texas Eastern Transmission Co., P.O. Box 1612, Shreveport, La. 71130.

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Third-Party Leasing — Part II

What About Extensions, Maintenance?

By Thomas E. McCormick
Special to Computerworld

There are several areas of standard DP contracts which the user should carefully review to afford himself the best advantages.

For example, 24- to 48-month leases are generally more desirable than longer-term leases unless the lease terms permit subleasing or relocation of the equipment when it is outgrown, or when more economical equipment becomes available.

The user should realize that every item in the contract need not be leased for the same number of months.There is no good reason to enter a three-year lease which includes maintenance since such items are generally not subject to price protection or to a better price for a longer commitment. That may commit the customer to a 36-month obligation at the one-month price.

Provision should be made for automatic month-to-month extension beyond initial period unless either party requests termination. The lessee should try to negotiate some flat percentage decrease in payments for each extension. This could effectively carry forward the price protection of the initial period if the extension period lease rates are made at some percentage of the original period rates, i.e. 95%.

Naturally, if the lessor finds the price unattractive to him after the initial term of the contract, he may cancel it.

If the contract is not to be extended automatically, a cancellation notice should still be specifically required by one party.

Equipment changes and items with different term expiration dates may occur within one contract. The user may, by oversight, lose track of when the contract expires for certain items; or a clerical error might result in equipment being incorrectly scheduled for removal. A user will want to be assured of receiving a notice and reasonable lead time before equipment is removed by a leasing company.

Monthly charges should be handled on an item-by-item basis. This means that the lease prices are detailed rather than lumped into one or a few prices. No-charge items should be specified and treated as the other items. It should be clearly stated that cancellation or change of any item or items does not affect any of the other items. This serves to isolate cancellation penalty payments, or upgrade cost increases, and thereby make them known to the customer for purposes of considering changes during the contract. It also prevents an unreasonable penalty being imposed.

The user should specify that partial month's usage charges will be prorated using 1/30th of the monthly charge per day. Start and termination dates can therefore be any day of the month, and partial-use months would not be subject to full-month lease payments.

The user should also specify that there will be no additional use or additional shift charges of any sort for the hardware, metered or unmetered, if this is not specifically stated in the standard contract.

The user should specify maintenance days of the week and hours of coverage desired on an item-by-item basis. If holiday coverage is required, it should be specified. It's desirable to have maintenance costs listed separately from lease prices. If the lessee enters into separate maintenance contracts, he will have more control of his situation, and he will avoid paying use tax on maintenance in some states.

Charges should begin only after maintenance people have certified to the user that every component of the system supplied by the lessor is operable; no charges should begin on any component until all components supplied by that lessor work together properly.

The user should attempt to specify that lease charges will be suspended if equipment is not operable beyond some reasonable amount of time.

Part III discusses taxes and insurance, investment tax credits and purchase options, machines, freight and installation and de-installation charges.

Thomas E. McCormick spent several years with IBM as a sales representative before becoming director of computer operations at the Seidman & Seidman National Computer Center.

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Boston Carpool Gets 'Excellent' Public Response

By Marguerite Zientara
Of the CW Staff

BOSTON – "Excellent. Really astounding. We were amazed." These are the words of Jerry Wishnow, creative services director, WBZ Radio, describing public reaction to the Commuter Computer Clubcar, a new, large-scale computerized carpool operating in the Boston area.

After three weeks of heavy television and radio promotion, just under 6,000 names are in the computer and a "realistic" full-scale prediction for the system is 35,000 to 40,000, according to Wishnow.

The service, created in cooperation with the ALA Auto and Travel Club, will furnish (for 10 cents) the names, addresses and telephone numbers of 10 people working and living near each commuter.

The system requests the commuter's destination by landmark or area; the time he must be at work; the time he leaves in the afternoon; and preferences as to all-male or all-female, drive-only or ride-only clubcars. The system also offers names of people who leave work an hour later than the commuter so he may stay late, as well as offering carpool service to major sporting events in Boston.

The system operates on "just a small IBM card sorter," according to Wishnow, except for manual sorts which are performed for destinations other than those listed on the application.

No Trespassing—Private Data

STOCKHOLM, Sweden – The Swedish Data Act that created the Data Inspection Board and codified a person's right to privacy in computerized systems [CW, Sept. 19] also established a new criminal listing – the data trespasser.

"Any person who, without authorization, effects access to recording for ADP or unduly alters or obliterates such information or includes it in a register will be sentenced for data trespass to pay a fine or to a term of imprisonment not exceeding two years if the perpetration is not punishable by the penal code," according to the new law.

This, apparently, is the first time the theft of data or the alteration of records kept in DP systems has been made a crime anywhere in the world. In most previous cases, the person whose information was stolen had to prove the value of the information so the case could come under the larceny statutes.

Microfilm Retrieval System Speeds Fingerprint ID for New York Police

NEW YORK – An anticrime microfilm system that has been running successfully on a trial basis in Queens County since March has been ordered made available to the New York Police Department in every borough by October.

The system, called Miraquic, consists of an optical scanner, microfilm retriever and a CRT screen and is used to identify fingerprints and "mug shots."

About 60 persons a day are arrested in Queens, according to Detective Albert Frommelt of the 109th precinct. With the Miraquic system, fingerprints are taken of each person arrested and each print is given a three-digit code – the first digit designates the pattern of the fingerprint, the second digit designates the number of lines in the pattern and the third digit describes the core of the fingerprint, the exact center of the pattern. The codes are put on the microfilm.

"Latent" fingerprints, those found at the scene of a crime, can then be analyzed and searched according to the three designations at the rate of 6,000 prints in 15 seconds, according to Frommelt.

In addition to fingerprints, the system stores photographs of arrested persons, with the ability to search 600 photographs in 15 seconds, looking for particular characteristics, Frommelt said.

A spokesman for the chief of detectives' office said the city is considering offers from a number of companies for the city-wide installations but declined to name the companies. He said the October deadline is contingent on the hiring and training of new personnel for the system.

The Queens system is made by Eastman Kodak.

Here's what you always wanted to know about your IBM 370.

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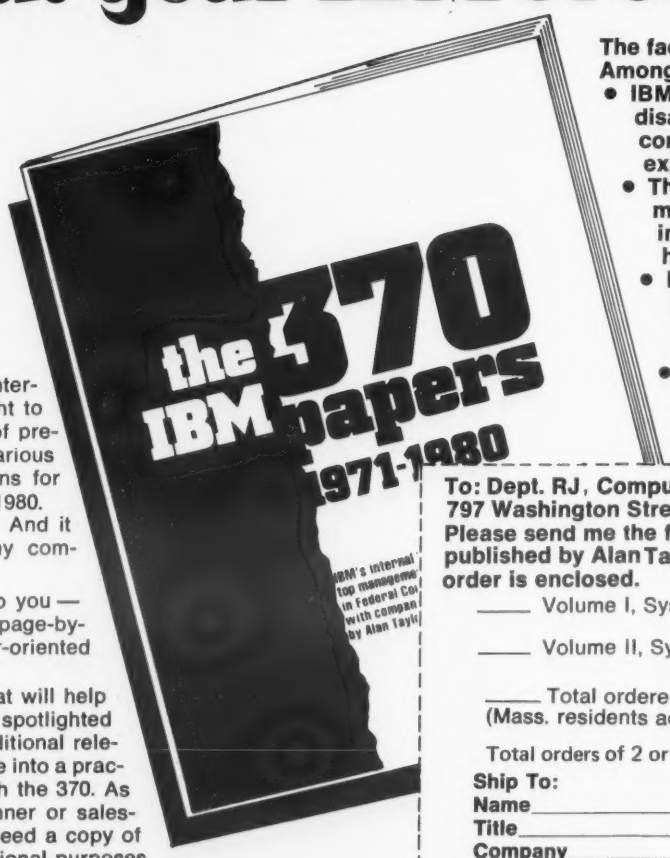

Thanks to actions in Federal Court, IBM's internal papers on its IBM 370 have been brought to light. These "Greybooks" contain a wealth of previously unavailable information on the various models of the 370 — including detailed plans for last year, next year, and every year through 1980. Even IBM salesmen haven't seen most of it. And it can be an invaluable planning tool for any computer installation.

Now these Greybook reports are available to you — in clear, easy-to-read book format — with a page-by-page commentary by the well-known, user-oriented columnist, Alan Taylor.

Almost every page has some information that will help your installation. Alan Taylor's commentary, spotlighted by a specially designed format, provides additional relevent information, and helps make each volume into a practical, useful tool for everyone concerned with the 370. As user, manager, controller, programmer, planner or salesman, there is something here for you. You need a copy of one or more of these books for your professional purposes — and you will want your colleagues to have their own copies so that you can work together.

The facts in these books are fascinating. Among other things they contain are:

- **IBM's own analysis of the advantages and disadvantages of 370 models against the competition. (Your Software and Hardware experts both need this information.)**
- **The descriptions of the planned enchancements for System 370's — and the dates involved. (Your Financial man needs this to help with Rental/Purchase decisions.)**
- **IBM's plans for the 'death' and replacement of 370 models — and data about their successors. (A unique feature that *everyone* should read and understand.)**
- **IBM's use of error-containing hardware for part of the 370 line — hardware that was supposed to be scrapped.**
- **And much more.**

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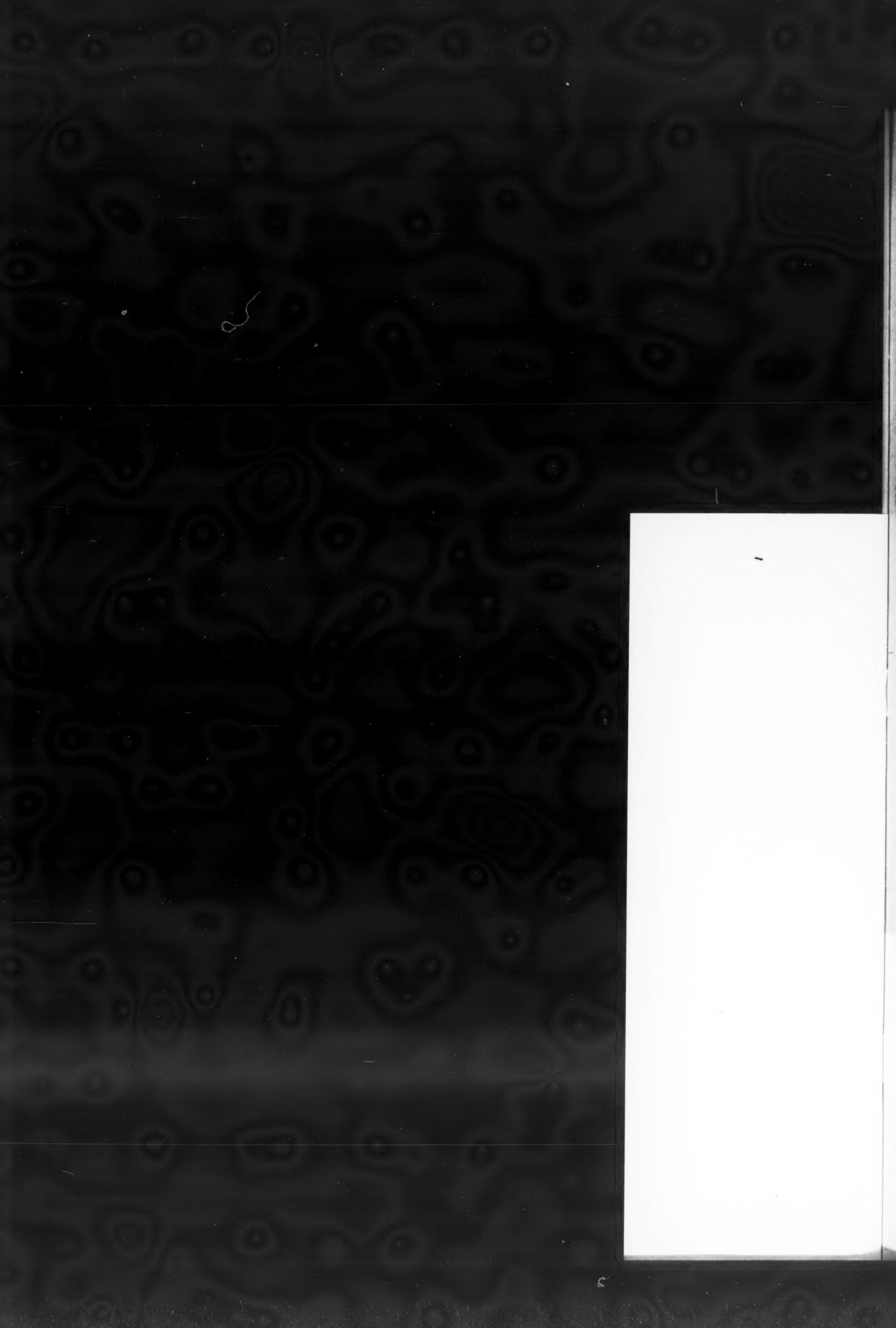

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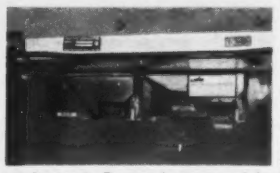

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Spectators Judges in Beauty Contest

By Marguerite Zientara
Of the CW Staff

DETROIT – A computerized beauty pageant, for a time under investigation by the Wayne County prosecutor's office, will continue now that officials feel the resemblance to a lottery has been removed.

The Miss Greater Detroit pageant, to be judged by each person who buys a ticket, offers sponsors and "spectator-judges" a chance to win a trip to Las Vegas and/or $10,000.

Each spectator is now allowed only one vote in the computer-programmed balloting.

According to the prosecutor's office, if the spectators had been allowed to buy as many tickets as they wanted and thus vote according to number of tickets – increasing their chances of winning the prizes – the situation would have resembled a lottery which, except for the state lottery, is prohibited by Michigan law.

In addition, according to Paul Teranes, an assistant prosecutor, the system has to offer the customer something besides the chance of winning a prize.

"It was somewhat similar to the football pool – you had to pay money to get a chance and you got nothing else but money for it. We just advised them that they were in a shaky area," he said.

In order to minimize resemblance to a lottery in the contest, the final local pageant will be held at Cobo Hall in downtown Detroit instead of at the originally slated Detroit Race Course, which was thought to enhance the gambling aspect of the contest, according to Phy Stephens of the Weldon Group, a local public relations agency organizing the pageant.

In addition, spectators will be served dinner at the pageant, though there will be a gallery section for voting only, Stephens said.

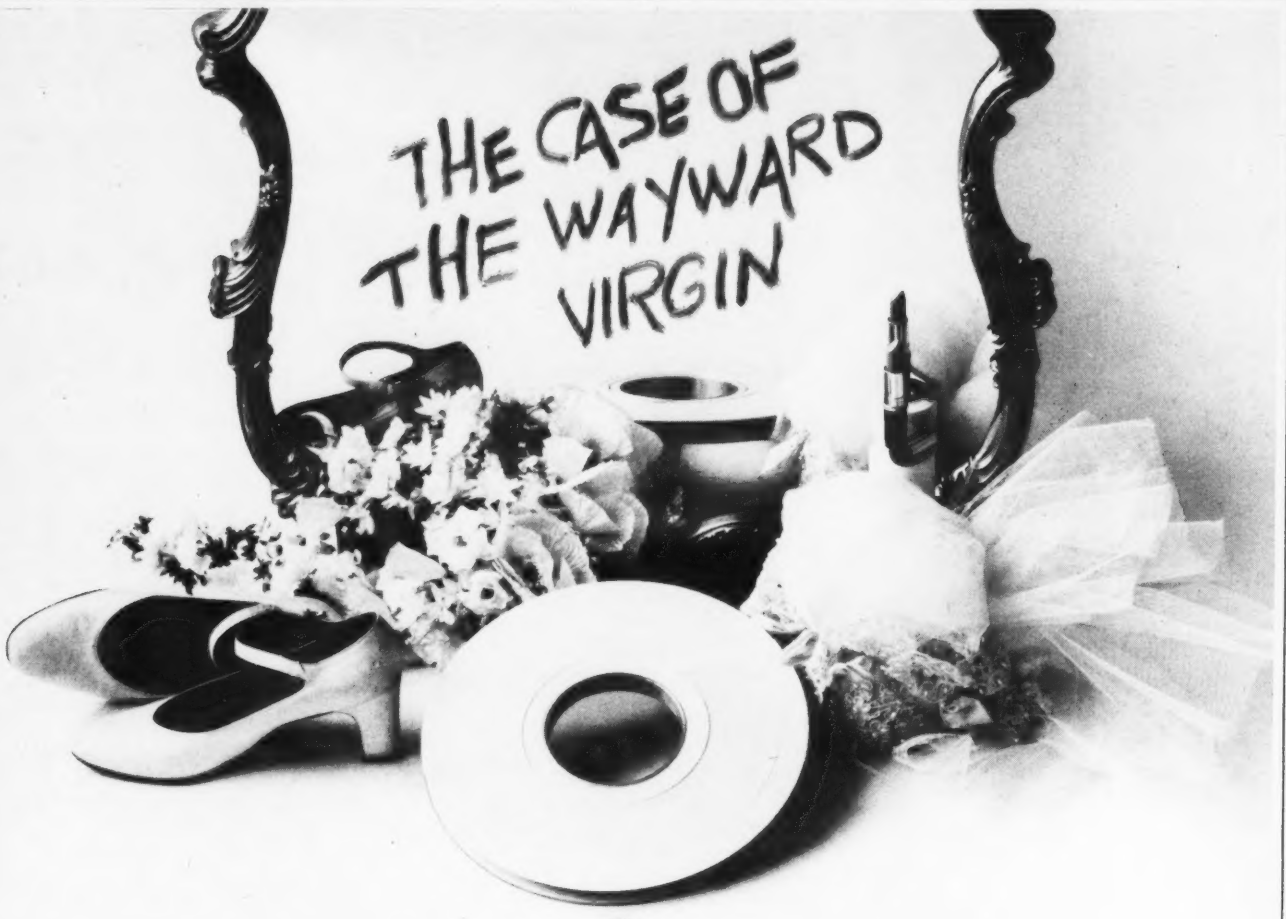
Upon entering the hall, each spectator will be handed a computer card with which to vote, and everyone will be allowed only one vote.

"It doesn't violate anybody's law to sell a computer ticket as long as people are getting something for it," according to Stephens. "They're getting a fashion show and they're getting a dinner."

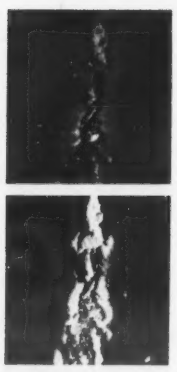
Thirty local finalists in the pageant for Miss Greater Detroit, selected by a panel of judges on Aug. 5, are encouraged to sell tickets for the balloting scheduled for Oct. 21. Each person who buys a ticket becomes a "spectator-judge."

The computer will count the votes, select the winner and rank the runners-up in order of votes received. The spectator-judge who picks the seven most beautiful women in the same order as the computer will win a trip to Las Vegas for the national pageant, also to be judged by spectators. The spectator who selects the final seven national contestants in the computerized order will win the $10,000 prize.

Local promoter Tom Gelardi said 50 cents of each $2 ticket sold will go to a charity operated by a Catholic nun who rehabilitates homes for needy families. The remainder of the profits will be divided between Reynolds Associates, the Las Vegas producers, and the Weldon Group.



...Or,
"error-free" doesn't necessarily mean nobody's fooled around with your tape.



In the computer tape business, they sometimes keep important little secrets from you. For example, tape that's supposed to be virgin (certified as "error-free" at time of certification) doesn't necessarily mean its never been touched. This is shown at left. Tape in top picture has been scraped or "doctored" so serious imperfection passes undetected by the certifier. But repaired error (bottom picture) is now detectable after 100 passes on tape drive.

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'But Who Will Enforce It?'

Industry Jubilant Over Decision

"IBM has taken close aim at the leasing companies and independent peripherals firms . . . I have every hope that this will stem the tide." – Roger Goetz

By E. Drake Lundell Jr.
Of the CW Staff

TULSA, Okla. – Like a dying man given a new lease on life, the independent peripherals industry reacted jubilantly to the decision handed down last week in the IBM-Telex antitrust case.

The Talk of The Industry

"We're all two feet off the ground," said Dan McGurk, president of the Computer Industry Association, which counts several independent peripherals firms among its members.

The decision will be a tremendous boost for the computer industry as a whole and will allow small suppliers to remain viable in the business, McGurk said, thereby offering users a wider choice of equipment.

In addition, the decision will make it easier for capital-starved plug-compatible equipment manufacturers to get financial backing, he said, because the financial community will no longer fear IBM actions.

Not All Rosy

But while the reaction was generally one of jubilation, there was some concern over how IBM would implement the judge's orders and some feared IBM might try to circumvent the orders. There was also concern over what new tactics IBM might take against the competition.

"I think the decision is great," one source said, "but I'm not sure who is going to enforce it and if that enforcement will be effective. If it is, great, if not, well I don't know."

Another who admired the decision indicated he was only worried over what new policies IBM might adopt to fight competition that is outside the scope of the decision.

"I'm sure they're planning new ways to beat the competition right now at Armonk," he said. "It will be interesting to see what they come up with in a couple of months."

Roger Goetz, vice-president at Computer Investors Group, said he has "every hope that this [decision] will stem the tide," noting that in the past few years "IBM has taken close aim at the leasing companies and independent peripherals firms."

He agreed the decision should make the financial community less "skittish" about investing in smaller companies – a situation he feels could benefit all companies.

However, he noted he is "anxious to see how IBM implements the decision" and said the true effects would not be known until the new IBM policies are implemented in the marketplace.

"Who knows what strategies they can think up before they carry out the judge's order?" he asked.

At Calcomp, President Lester Kilpatrick said "justice has been served by the decision."

(Continued on Page 54)

Firms Have Suits in Their Eyes

TULSA, Okla. – The possibility of several firms filing antitrust suits against IBM took an upturn last week with the decision in the IBM-Telex case.

Several firms in the independent peripherals area have been watching the Telex case closely and now can be expected to file their own suits.

Itel Corp. admitted last week it was "studying the alternatives" on filing a suit and would make a decision soon, while Calcomp felt it would also study the possibility of filing an action against IBM.

Memorex, reported to be studying the possibility of a suit against IBM, would not comment last week.

"We'd be fools not to sue," one independent said, "if the Telex case holds up on appeal. We were damaged as much as they were by IBM's practices."

In addition, several sources noted other independent peripherals companies could use the large amount of formerly secret IBM internal documents uncovered by Telex if they filed new suits – saving a great deal of time and trouble.

Some Stock Prices Feel the Shock Waves

By Michael Weinstein
Of the CW Staff

The IBM antitrust decision fell on Wall Street like a rock sending waves through the financial community that may eventually change traditional views of viable companies and good investments.

The immediate big winners are the plug-compatible peripheral and independent memory builders with the stock prices of leasing companies and other mainframe builders not seriously affected.

The immediate loser, of course, is IBM whose stock fell $26 the day of the decision (Monday, Sept. 17) to close at $272 – the lowest point for the year.

This represents a total loss of $3,785,158,000 to IBM shareholders – a figure greater than the 1972 sales of any U.S. firm outside the *Fortune* Top 20.

On Tuesday, trading was suspended for over four hours due to "increased activity beyond NYSE's ability to handle," according to a stock exchange official. When IBM stock was finally opened for trading, its initial value was $253 a share – a loss of an additional 19 points overnight.

A spokesman for a major brokerage house stated it was still too early to make any value judgment on IBM's ability to maintain its star position on the stock exchange.

But a research analyst for the same firm was more candid, stating, "Of course, the spokesman has to say that, but a one-day move from recommending that investors buy IBM to a neutral position has to mean people think something drastic has happened."

Another analyst at Paine, Weber, Jackson and Curtis echoed the feeling that Wall Street was feeling shock waves, but he was more conservative in his analysis.

"The decision is very important, but people tend to forget IBM is still extremely viable and has large assets," he said.

There is still a long appeals process to go through and during that period IBM can take other actions such as radically new designs of computer equipment "that is harder to duplicate."

"The fallout may take years before it finds its way into the balance sheets of IBM and other competing companies, and even then only if IBM loses all the appeals and does not come up with a new counter-strategy," he asserted.

But real or unreal, immediate or long-term, the Telex decision had immediate results for other computer manufacturers with stock prices rising across the board for peripherals manufacturers and memory makers, but remaining somewhat constant for leasing companies and other mainframe builders.

"There is one notable exception," according to Jack LaMothe, manager of data bases for Interactive Data Corp., "in the area of leasing companies, where Greyhound has apparently been boosted in the hope the Telex settlement will have a beneficial effect on future appeals Greyhound may have in its trial against IBM."

Stock	Friday Close	Friday Sales (1000s)	Tuesday Close	Tuesday Sales (1000s)	Change % $
Mainframe Manufacturers					
IBM	298.0	31.9	259.5	290.4	-12.92
Burr.	224.8	11.9	218.8	49.3	- 2.67
CDC	37.3	21.9	39.5	114.7	+ 6.04
HON	109.5	18.6	112.4	22.9	+ 2.63
NCR	35.0	37.2	35.6	40.2	+ .02
Sperry	51.4	62.9	50.0	115.9	- 2.68
Plug-Compatible Firms (Selected)					
Ampx	4.5	4.7	4.8	13.7	+ 5.56
CalC	10.5	25.8	12.4	58.5	+17.86
EM&M	4.2	2.6	4.5	16.5	+ 9.09
MDS	5.9	18.6	6.3	91.2	+ 6.38
Potter	4.2	2.2	6.5	36.2	+57.58
Telex	4.3	72.8	7.9	1010.7	+85.29
Leasing Firms (Selected)					
Dearborn	15.9	3.4	15.5	2.9	- 2.36
DPF	4.9	3.1	5.0	2.8	+ 2.56
Leasco	12.4	37.2	11.0	13.9	- 6.06
Greyh	3.9	—	5.4	9.5	+43.33

Figures from the Interactive Data Corp. data base indicate the Telex decision had its most marked effect on plug-compatible peripheral makers.

Judge Takes Telex to Task

By E. Drake Lundell Jr.
Of the CW Staff

TULSA, Okla. – Almost lost in the hubbub and jubilation within the industry over the Telex victory are the restrictions and penalties imposed on the firm by Judge A. Sherman Christensen for its misappropriation of IBM trade secrets.

Christensen ordered Telex to pay IBM over $21.9 million for its "planned, deliberate and willful" misappropriation of IBM secrets, a sum that should make the whole DP industry pause in its celebration.

The Telex practices, Christensen said, were "a programmed and massive invasion by Telex of IBM's trade secrets."

The record shows, the judge said, "that Telex has engaged in a continuing course of activity calculated to induce the disclosure by IBM employees of IBM confidential information in breach of their fiduciary obligations to IBM so Telex can misappropriate such information to its own use and benefit."

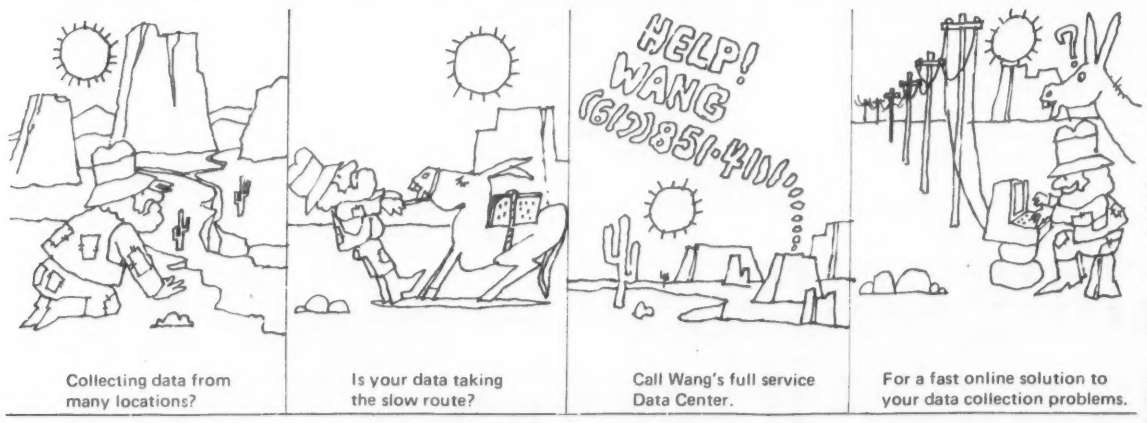
'Widespread . . . Effort'

"The court here deals not with isolated instances of misappropriation by Telex . . . We have been confronted here by a widespread, purposeful effort of Telex to secure confidential technical information concerning the design of products which were then unannounced, for the purpose of duplicating such equipment through use of such confidential information."

The judge also found that "Telex's pattern of recruitment, job assignment, production growth and compensation arrangements were so designed as to lead inevitably to the misappropriation of IBM's confidential information.

"Telex's past pattern of conduct makes it apparent that such misappropriation

(Continued on Page 54)



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Telex Will Pay for Violations

(Continued from Page 53)

will continue unless the court provides protection commensurate with the threat posed by Telex's deliberate and continuing course of improper behavior with respect to the invasion of IBM's trade secret and confidential information."

In addition to the fine, the judge also placed severe restrictions on Telex's hiring policies in the future and ordered the return of all IBM material obtained illegally.

Telex was ordered "to return to IBM all IBM documents and all Telex documents containing IBM confidential information which are in Telex's custody or under its control, and to destroy all copies of Telex manuals under its control or in its custody," which infringe IBM copyrighted manuals.

In addition, it is ordered "to refrain from hiring or soliciting any IBM employee for a period of two years without approval from the court," and is ordered to "refrain from assigning any former IBM employee . . . to the development or manufacture of products functionally equivalent or similar to those on which such employees worked at IBM for a period of not less than two years" after he leaves IBM.

In the area of damages, the judge ordered Telex to pay $13,776 for copyright violations, $4.5 million for losses sustained by IBM because of Telex's early entry into the 3420 tape market, $13 million in damages due to the advantage Telex gained from having proprietary information on IBM Aspen and Merlin products, $3 million for the cost of increased security that had to be used by IBM, $400,000 for extra costs IBM had to pay to have a product made in-house; and $1 million in punitive damages.

While the judgment was stiff against Telex's "willful and deliberate" misappropriation of trade secrets, several sources last week indicated further such problems may be solved by another part of the judge's ruling.

In that, he ordered IBM to reveal the specifications for its interfaces either when products were announced or when they were released to manufacturing or production.

"If that had been in effect three years ago, Telex would not have had to go to the trouble it did to find out what IBM was doing," one source noted.

Independents Jubilant Over Court's Decision

(Continued from Page 53)

Kilpatrick also noted the decision would make the financial community less leery of investing in the independent peripherals producers, but he said the decision would probably not draw many new companies into the business because there still might not be enough financial backing for new entries.

Gary Friedman, president of Itel's computer operation, said his reaction to the decision was "definitely positive" and said the judge showed "a very clear understanding of the problems in the business.

"If the injunctive relief stands up on appeal, this decision will definitely open up competition in this industry," he added.

CDC Feels Settlement With IBM Was Fair

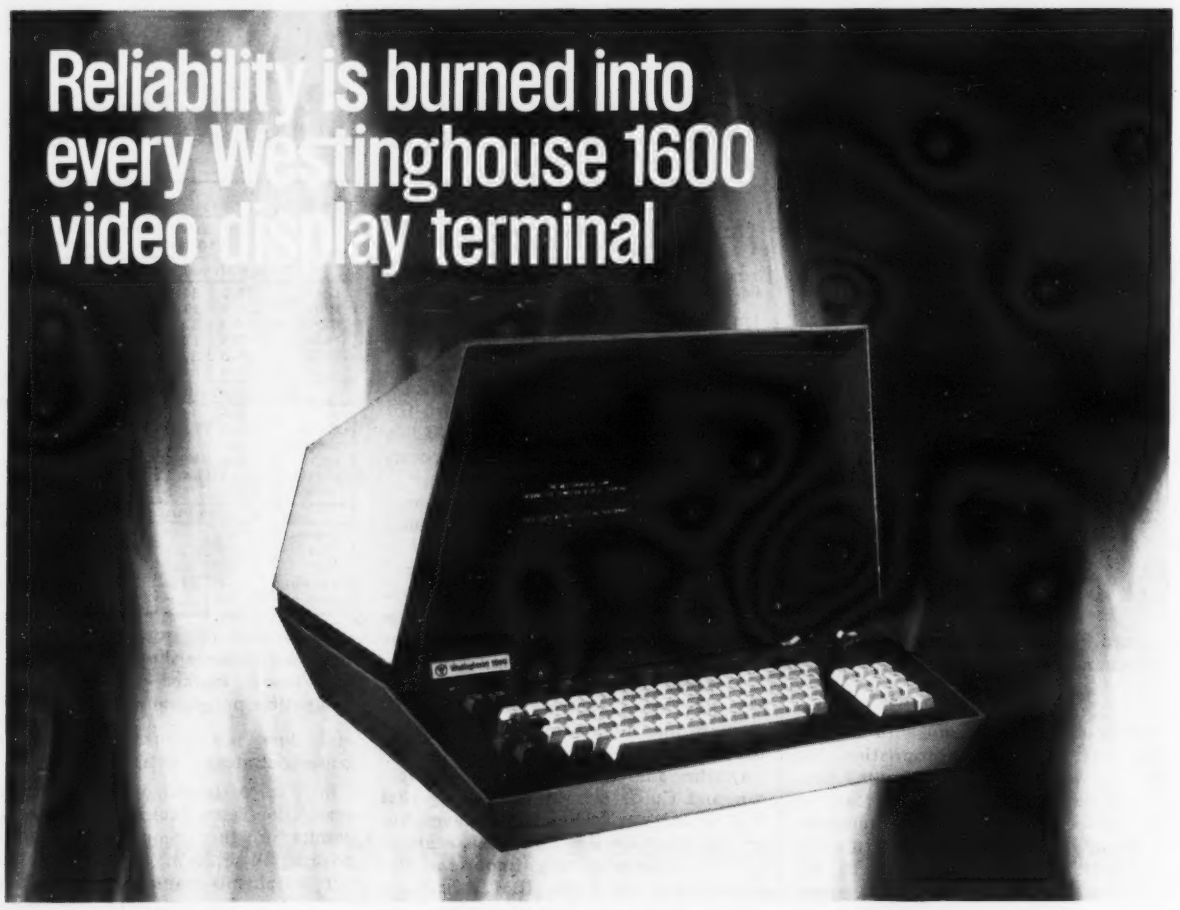
MINNEAPOLIS, Minn. – Control Data Corp. President William Norris, whose firm settled its antitrust suit against IBM out-of-court several months ago, stated it would be inappropriate for him to discuss the merits of the Telex decision other than to state that CDC had long been an advocate of many of the actions taken by Judge A. Sherman Christensen.

In retrospect, Norris stated he had no misgivings about the fact that CDC and IBM settled out of court. "I stated at the time and still feel the settlement between us and IBM was equitable to both sides," he said.

Service Analyzes IBM Antitrust Cases

NEWTONVILLE, Mass. – The IBM Litigation Reporting Service, a subscription program to keep companies and investors in the computer industry apprised of developments in the current antitrust cases in which IBM is defendant, has been announced by International Data Corp., a computer industry research firm.

Initiated this month, the service offers analyses and commentaries concerning the more significant events in the litigation of antitrust complaints filed against IBM by the Telex Corp., Greyhound Computer Corp., and the U.S. Department of Justice.



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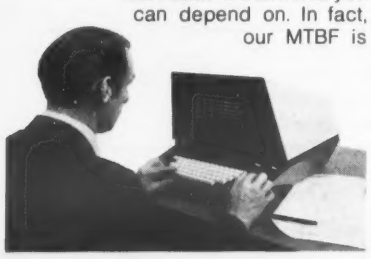

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The Judgment and Decree

FILED
SEP 17 1973
Jack C. Silver, Clerk
U.S. DISTRICT COURT

In the United States District Court
For the Northern District of Oklahoma

The Telex Corp. and
Telex Computer Products, Inc.,
Plaintiffs,

vs. **No. 72-C-18**
International Business Machines Corp., **No. 72-C-89 (Consolidated)**

Defendant
Judgment and Decree

The issues having been duly tried to the court, findings of fact having been made, and conclusions of law having been entered; now, accordingly,

It is hereby ordered, adjudged and decreed:

1. That plaintiffs, The Telex Corp. and Telex Computer Products, Inc., have and recover judgment of and from the defendant International Business Machines Corp. in the sum of $352.5 million, after the found actual damages have been trebled as required by law, together with costs and attorneys' fees, the amount of such attorneys' fees to be reserved for future determination.

2. International Business Machines Corp. is hereby permanently enjoined from enforcing or collecting any contractually specified penalty payments which it otherwise might be entitled to collect because of termination upon 90 days' notice of any long-term lease agreements heretofore entered into between IBM and any of its end-user customers, including but not limited to IBM's Fixed Term Plan leases, Extended Term Plan leases and Term Lease Plan leases.

For a period of three years from and after the date of this judgment International Business Machines Corp. is enjoined and prohibited from including in any lease agreement for electronic data processing products for terms in excess of 90 days any provision requiring payment of any liquidated damages or penalty because of the customer's earlier termination of said lease agreement.

3. At the time of a product announcement concerning any EDP product, or at the time of release of such product for manufacturing and production, whichever first occurs, International Business Machines Corp. is enjoined and required to publicly describe and disclose the design of the electronic interface for such product in sufficient detail as to make feasible the reproduction of such interface by other qualified manufacturers; and within 60 days from the entry of this judgment, International Business Machines Corp. shall similarly describe and disclose the details of the design of the electronic interface for each System 370 EDP peripheral product that it has announced heretofore.

4. International Business Machines

(Continued on Page 56)

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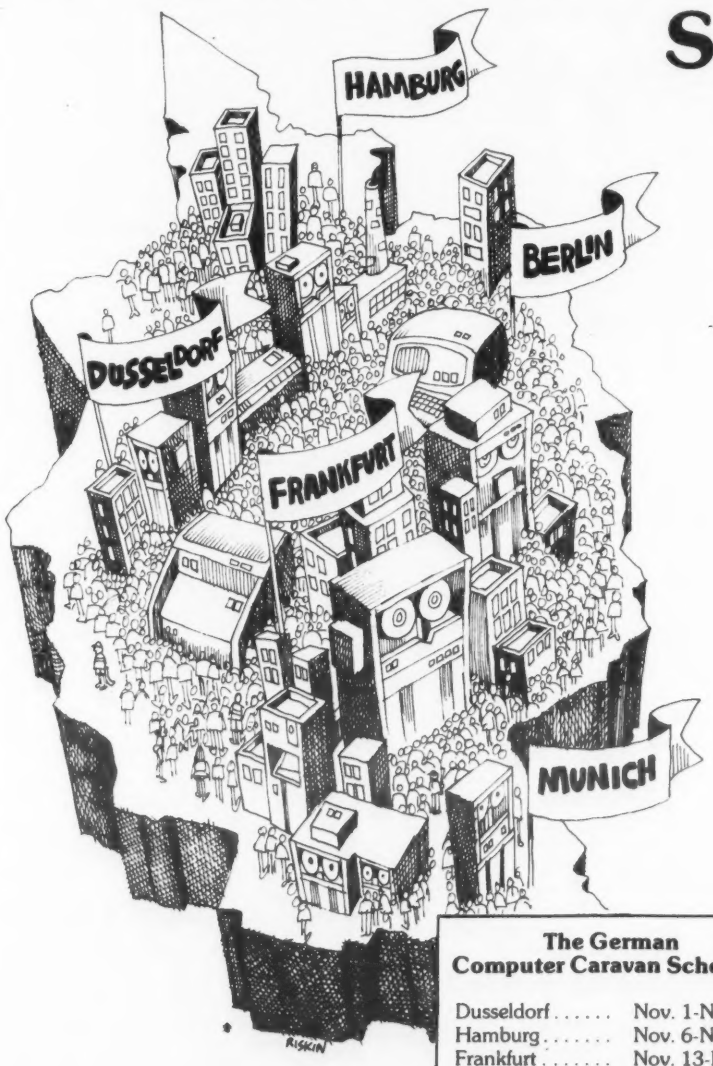

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Christensen's Decree and Judgment in Antitrust Suit

(Continued from Page 55)

Corp. is enjoined and prohibited from single or "bundled" pricing of IBM memories with its System 370 central processing units, that is, from charging a single price for both the central processing unit and the memory, and within 60 days IBM shall separately price its CPUs and memories.

This does not prohibit, restrict or enjoin International Business Machines Corp. from selecting any particular physical locations or packaging of its products so long as these requirements and those stated in the next succeeding paragraph are followed.

5. International Business Machines Corp. is enjoined and required to separately price its functionally different products, including but not limited to central processing units (CPUs), memories, tape products and their controllers, disk products and their controllers, printer products and their controllers and communication controllers regardless of whether it elects to place such products in single cabinets or in multiple boxes or cabinets.

International Business Machines is further enjoined and required to set its prices for all such functionally different EDP products by using or applying a substantially uniform percentage markup over actual designing, manufacturing and marketing costs as between such integrated and separately boxed products.

6. International Business Machines Corp. is enjoined from adopting, implementing or carrying out predatory pricing, leasing or other acts, practices or strategies with intent to obtain or maintain a monopoly in the market for EDP peripheral equipment plug compatible to its CPUs, or any relevant submarkets thereof.

7. International Business Machines Corp. shall have and recover from Telex Corp. and Telex Computer Products Inc., the total sum of $21,913,776, made up as by the Conclusions of Law shown, together with costs and attorneys' fees in connection with its copyright claim to be hereinafter fixed.

8. Telex Corp. and Telex Computer Products Inc. are enjoined:

a. To return to IBM all IBM documents and all Telex documents containing IBM confidential information which are in Telex's custody or under its control, and to destroy all copies of Telex manuals under its control or in its custody which infringe IBM copyrighted manuals.

b. To refrain from hiring or soliciting any IBM employee for a period of two years without approval from the court.

c. To refrain from copying any IBM copyrighted materials.

d. To refrain from soliciting or using any IBM confidential or proprietary information.

e. To refrain from assigning any former IBM employee employed now or in the future by Telex to the development or manufacture of products functionally equivalent or similar to those of which such employee worked at IBM for a period of not less than two years following the termination of his employment with IBM.

9. Except for the fixing of the amounts of attorneys' fees and costs to which the respective parties are entitled, the court pursuant to Rule 54(b) Fed. R. Civ. P. determines that there is no just cause for delay in the entry of this judgment, and the clerk is hereby directed to enter final judgment in accordance with the foregoing forthwith on all issues except as to the amounts of the attorneys' fees, which shall be covered by supplemental judgment, there being hereby granted a stay of execution until the disposition of the post-trail motions hereinafter mentioned, or until the court otherwise orders.

10. For the purposes of fixing the amounts of said attorneys' fees, considering any motions filed within 10 days of entry of this judgment for correction of the findings of fact, conclusions of law and judgment pursuant to Rule 60(a) Fed. R. Civ. P., or to amend findings and judgment pursuant to Rule 52(b) Fed. R. Civ. P., or to alter or amend judgment or for a new trial pursuant to Rule 59(a), (e), Fed. R. Civ. P., a hearing will be held at the United States Courthouse, Tulsa Okla., on Oct. 16, 1973, beginning at the hour of 10 a.m.

Dated this 14th day of September 1973.

A. Sherman Christensen
Senior United States District Judge
(Assigned)

UK Firm Seeks 40% Of Dearborn Common

LONDON – **Trafalgar House Investments Ltd.** has completed its tender offer for 40% of **Dearborn-Storm Corp.**'s common stock at $25 a share. Trafalgar, which has received tenders for 1,534,250 shares, or more than 40%, according to Dearborn, will return any unpurchased stock. Dearborn has about 2.6 million shares outstanding.

Itel Corp. has agreed in principle to acquire **D.C.S. Computer Services** for an undisclosed amount of cash. The agreement, subject to execution of a contract satisfactory to both parties, provides for the acquisition of substantially all of the assets of D.C.S. subject to the assmption of substantially all of its liabilities by Itel Corp. or a wholly-owned subsidiary of Itel.

Acquisitions

Reynolds & Reynolds Co. has agreed to acquire **Diversified On-Line Computing, Inc.** for an undisclosed price.

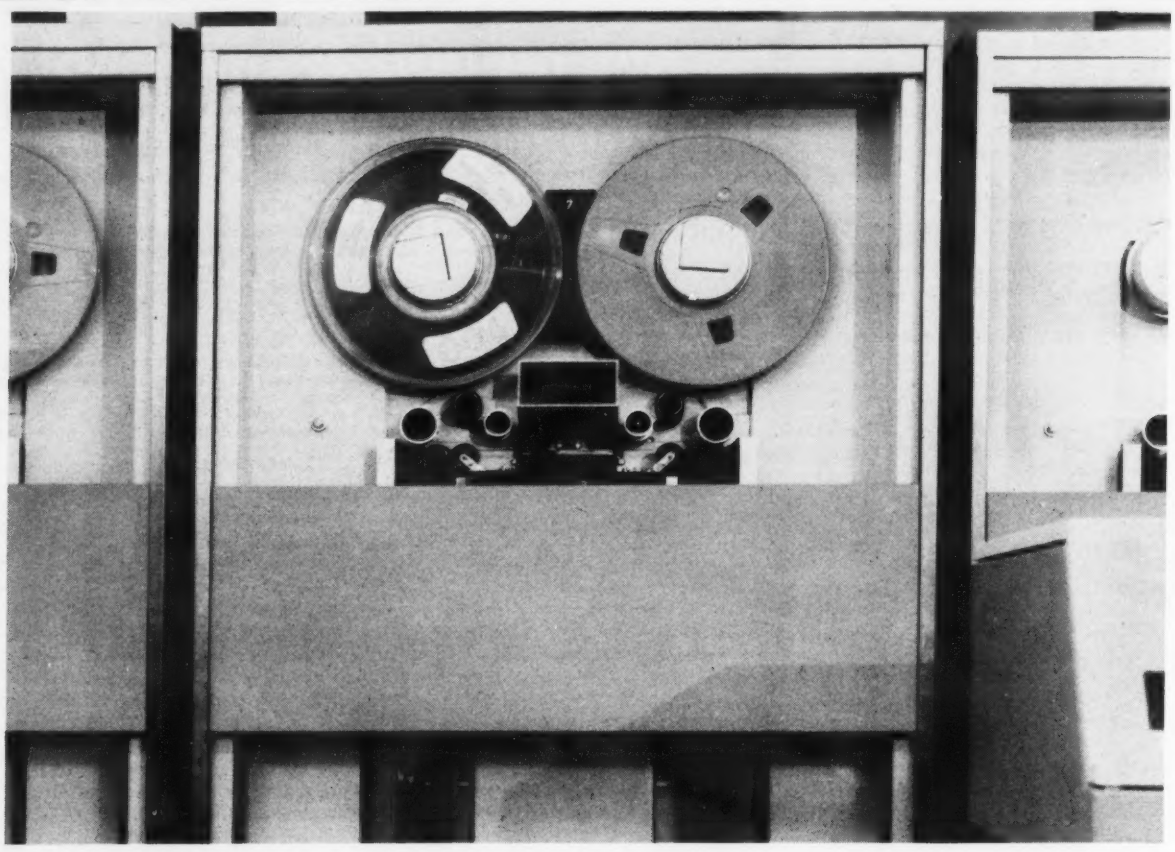
Synergex Corp., formerly Drug Service, Inc., has acquired **Octal Systems, Inc.** and **Pharm-Assist, Inc.** Octal is the developer of the on-line pharmacy system used by Pharm-Assist.

Western Union Corp. has acquired **National Sharedata Corp.** The acquisition was made through a transaction in which .387 share of Western Union common was exchanged for outstanding share of National Sharedata common. Approximately 890,000 shares of Western Union common were exchanged.

Tektronix Inc. has signed an agreement to acquire **Grass Valley Group Inc.**, for about 470,000 shares of Tektronix common. The value of the transaction will be about $19 million. Under the agreement, Grass Valley Group will be merged into a newly formed subsidiary of Tektronix.

Compu-Serv Network, Inc. has acquired **Alpha Systems, Inc.** for an undisclosed amount of cash. Alpha Systems is operating as a wholly-owned subsidiary of Compu-Serv.

National Electronic Card Co., High Point, N.C., has acquired and reorganized **Business Supplies Corp. of America.**



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NCR Reorganizes Marketing Division To Reflect Business Types Served

DAYTON, Ohio – NCR is reorganizing its Domestic Marketing Division with the appointment of four vocational marketing vice-presidents to supervise marketing activities in one or more of the 10 major markets served by the company.

The move will become effective by the end of the year.

Traditionally, the firm's U.S. marketing organization has been product-oriented rather than organized by the lines of business the company serves.

"With the advent of new types of data terminals and the expansion of NCR's computer capabilities, NCR can now provide its customers with total systems based on the specific needs of their industries. For this reason, we are reorganizing along vocational rather than product lines. In this way NCR customers will be assured of getting systems tailored to their specific requirements and patterns of operation," President Walter S. Anderson said.

In the future, NCR salesmen will have access to the company's entire product line as well as all supporting services beamed at particular industries.

The 10 major market areas are: commercial banks; savings institutions; retail firms including department, discount and specialty stores; food distribution firms including supermarkets; manufacturing companies; wholesalers; hotels, motels and food service operations including restaurants and fast-food outlets; medical institutions including hospitals; educational institutions, and government offices.

Reporting to the vocational vice-presidents will be regional vocational managers who will serve several-state areas.

The four vice-presidents are Herbert M. Schene, vice-president, commercial-industrial marketing; William F. Walsh, vice-president, financial marketing; G.P. Williamson Jr., vice-president, medical-education and government marketing; and Daniel J. McCarthy, vice-president, retail marketing.

Contracts

Modular Computer Systems, Inc. has signed an agreement with Bailey Meter Co. for the sale of multiple Modcomp II-based single and multiprocessor systems for power plant monitoring and control applications. The Modcomp system interfaces with Bailey real-time input/output equipment to monitor analog process measurements and plant equipment status.

Leader Corp., Alamogordo, N.M., has signed a five-year facilities management contract with Seattle Trust and Savings Bank. Leader will assume full responsibility for the bank's total data processing requirements and establish an off-site computer service center to serve multiple banks in the Seattle area.

American Data Preparation Corp. (ADPC) has signed a marketing and services agreement with G.W. Data Services, Ltd., London. ADPC will provide the British company with data preparation services at ADPC's Malta facility.

Troy Computer Products, Inc., A Cordura company, has received a contract from Monarch Marking Systems, Inc., a Pitney-Bowes subsidiary, to manufacture the Monarch 2000 Codabar automated labeling and identification system for retail merchandise.

McDonnell Douglas Automation Co. has received a 42-month contract from Buffum's department store chain for data processing services.

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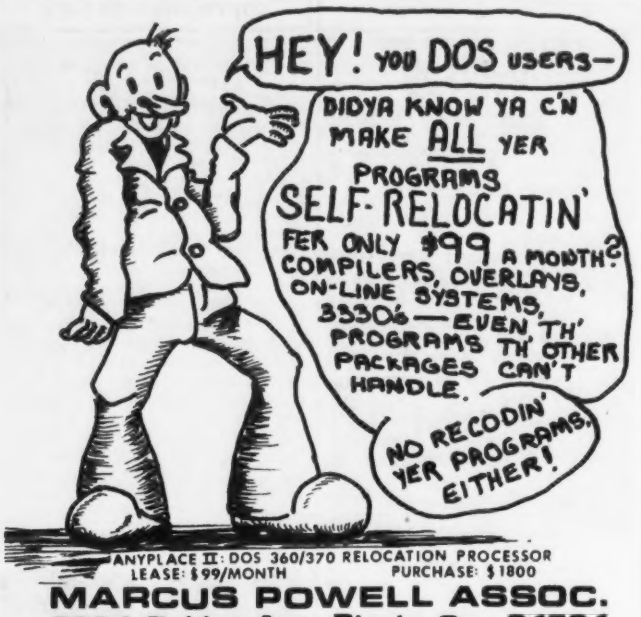

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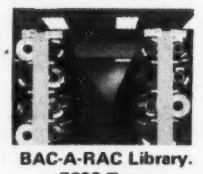

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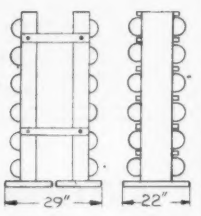

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'General Weakness' Noted

IBM Worried Wall Street Before Ruling

By Michael Weinstein
Of the CW Staff

NEW YORK – The Telex-IBM decision may have created the boom that started the avalanche in the value of IBM stock, but Wall Street was concerned with the stability of the mountain even before the ruling.

A wire to local Merrill Lynch offices on the Friday before the ruling indicated a general concern over the ability of IBM to maintain its star position.

'General Weakness'

A major factor in the deterioration of IBM stock value during the past months is attributable to a "general weakness of the office equipment issues," the report stated.

This weakness is compounded by a "general weakness of many high growth stocks" which "correlates with the historic experience that these stocks tend to underperform the averages in the latter stages of major market decline," it continued.

The report also warned of possible increased actions against IBM by both Congress and the Justice Department.

"The Tunney Bill may well serve to diminish IBM's chances of obtaining a satisfactory consent decree," the report contended.

This pending bill recommends that any consent decree, such as that between IBM and CDC, be made public prior to its taking effect to allow other affected parties to come forth prior to any settlement.

"While there have been no new developments in recent weeks in connection with the Justice Department's suit against IBM," the report indicated that "pretrial activity would probably pick up shortly now that Labor Day has passed.

"Being a multinational company, considered a major plus in the '60s and early '70s, may not be such an unalloyed boon in the future years. Some countries are becoming more nationalistic and are tending to impose trade restrictions and certain nations are providing their domestic computer companies with increasing financial and other assistance.

"Moreover, the United Nations is currently studying the impact of multinationals on their host countries," the report continued.

IBM President Frank T. Cary in happier times at a financial analysts' meeting.

Despite all of these warnings, Merrill Lynch rated IBM in the "buy" category on Friday, Sept. 14.

On Monday Sept. 17 the Telex decision came in and later that day Merrill Lynch advised its offices to drop IBM two positions from the star class of "buy" to the position of "neutral."

REI Posts Increased 3d-Period Earnings

DALLAS – Earnings were up in the third quarter and nine months ended July 31 at Recognition Equipment Corp., although revenues showed declines.

In the quarter, earnings rose to $1.8 million or 35 cents a share, including an $880,000 or 17 cents a share special credit.

This compares with earnings of $290,000 or 6 cents a share in the year-ago period, when there was a special charge of $38,000 or 1 cent a share.

Revenues were $10.3 million compared with $10.5 million in the 1972 period, which was restated to reflect the firm's investment in Corporation S, based on the equity method of accounting.

REI said 1973 results are reported under the Accounting Principles Board Opinion 30, which "limits the types of items reported as extraordinary but has no effect on net income."

Under prior accounting principles, REI would have reported a loss of $2 million before an extraordinary gain of $3.4 million, including proceeds from the sale of Docutel Corp. securities.

In the nine months, earnings totaled $1.2 million, including a $1 million or 20 cents a share special credit.

This compares with earnings of $411,000 or 8 cents a share including a $226,000 or 4 cents a share special credit last year. The 1972 earnings figures were originally reported as $994,000.

CA '73 Revenues, Earnings Doubled

IRVINE, Calif. – Computer Automation, Inc.'s 1973 earnings nearly doubled over those of a year ago, when the company announced its first profitable year.

Earnings reached $1.2 million or 75 cents a share compared with $598,864 or 46 cents a share a year ago. Revenues more than doubled to $11.3 million from $4.9 million in 1972.

President D.H. Methvin credited the rapid proliferation of applications for the firm's Naked Mini and Alpha minicomputers for the strong sales and earnings performance.

Excluding the tax-loss credits, the firm's income tripled to $1 million from $314,864 a year ago.

Computer Automation increased its tangible net worth during 1973 from $2.2 million to $6 million due to earnings from operations and proceeds from a public offering.

Earnings Reports

CORDURA
Three Months Ended July 31

	1973	a1972
Shr Ernd	$.14	$.33
bRevenue	28,972,000	28,149,000
Disc Op	(168,000)	(101,000)
dSpec Chg	264,000	.....
Earnings	848,000	2,034,000
9 Mo Shr	.73	.90
bRevenue	85,388,000	75,588,000
Disc Op	(390,000)	(134,000)
dSpec Chg	354,000	.....
Earnings	4,550,000	5,629,000

a-Restated to exclude results of discontinued operations. b-From continuing operations. d-From disposition of certain operations.

TALLY
Three Months Ended July 1

	1973	1972
Revenue	$2,828,683	$3,410,164
Spec Chg	a111,261	.....
Loss	280,589	208,120
6 Mo Rev	5,927,345	6,201,198
Spec Chg	a11,261	.....
Loss	615,764	430,142

a-From disposition of EDP division in May 1973.

COMPUTER USAGE
Three Months Ended June 30

	1973	1972
Shr Ernd	$.27	$.16
Revenue	1,026,493	1,024,710
Tax Cred	110,916	64,586
Earnings	231,075	134,554
9 Mo Shr	.62	.32
Revenue	2,502,944	2,620,663
Tax Cred	257,514	128,596
Earnings	536,488	267,908

COM-SHARE
Year Ended June 30

	1973	1972
Shr Ernd	$.34	a$.27
Revenue	8,515,361	6,773,276
bSpec Cred	21,665	260,585
Earnings	436,624	313,012

a-Fully diluted. b-In 1973, includes tax credit less loss on investments and writeoff of unamortized debenture registration costs and conversion rights; in 1972, includes gain on investments and tax credit less loss on closing of computer center.

ADVANCED MEMORY SYSTEMS
Three Months Ended June 29

	1973	a1972
Shr Ernd	.....	$.01
Revenue	$8,364,900	3,460,100
Spec Item	(495,000)	13,000
Earnings	(1,144,200)	17,400
9 Mo Rev	23,154,500	8,849,200
Spec Cred	42,200	.....
Loss	250,500	763,400

a-Restated to reflect acquisition.

ULTIMACC SYSTEMS
Three Months Ended June 30

	1973	1972
aShr Ernd	$.16	$.06
Revenue	807,960	259,847
Earnings	72,336	25,529
a6 Mo Shr	.20	.....
Revenue	1,414,627	429,910
Earnings	91,842	(59,987)

a-Fully diluted.

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Earnings Reports

INFORMATION MAGNETICS
Six Months Ended June 30

	1973	1972
aShr Ernd	$.23	$.08
Revenue	7,960,815	1,888,287
Earnings	291,110	78,598

a-On a primary basis.

FABRI-TEK
Three Months Ended June 29

	1973	1972
Shr Ernd	$.14	.....
Revenue	7,484,462	$4,396,656
Tax Cred	225,423	.....
Earnings	454,278	(19,541)

AUTOMATIC DATA PROCESSING
Year Ended June 30

	1973	a1972
Shr Ernd	$1.40	$.95
Revenue	89,653,000	71,991,000
Earnings	8,547,000	5,697,000

a-Restated for pooling-of-interests.

INFORMATION INTERNATIONAL
Three Months Ended July 31

	1973	1972
Shr Ernd	$.13	$.10
Revenue	2,328,374	1,970,108
Tax Cred	51,300	121,500
Earnings	336,268	266,548

ADVANCED SYSTEMS
Three Months Ended June 30

	1973	1972
Shr Ernd	$.02	.....
Revenue	919,000	$519,000
Earnings	16,731	(112,014)

SYSTEMS ENGINEERING
Year Ended June 29

	1973	1972
Shr Ernd	$.20	$.43
Revenue	17,082,000	15,719,000
aSpec Cred	343,000	308,000
Earnings	513,000	1,112,000

a-From tax-loss carryforwards in both years and sale of property in 1973.

RECOGNITION EQUIPMENT
Three Months Ended July 31

	1973	1972
Shr Ernd	$.35	$.06
Revenue	10,275,000	10,516,000
Spec Item	b880,000	d38,000
Earnings	1,793,000	290,000
9 Mo Shr	.24	.08
Revenue	28,308,000	29,128,000
Tax Cred	1,036,000	226,000
Earnings	1,229,000	411,000

a-Restated to reflect equity accounting. b-Tax credit. d-Debit.

AMPEX
Three Months Ended July 28

	1973	1972
Shr Ernd	$.08	.....
Revenue	62,653,000	a$55,906,000
Tax Cred	278,000	.....
Earnings	872,000	(3,155,000)

a-From continuing operations.

URS SYSTEMS
Three Months Ended July 31

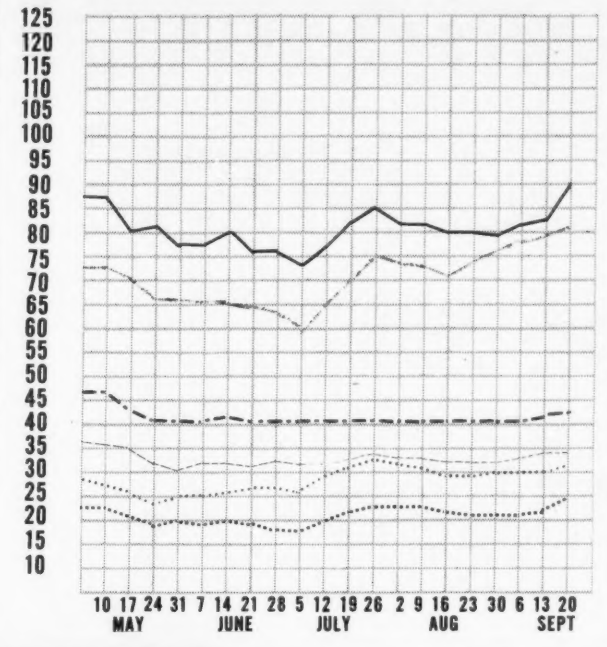
	1973	a1972
Shr Ernd	$.15	$.14
Revenue	7,289,000	7,121,000
Tax Cred	22,000	.....
Earnings	550,000	499,000
9 Mo Shr	.45	.35
Revenue	21,378,000	20,325,000
Tax Cred	150,000	.....
Earnings	1,560,000	1,252,000

a-Restated to include acquisitions on a pooling-of-interests basis.

GRI COMPUTER
Three Months Ended July 31

	1973	1972
Shr Ernd	$.03	.....
Revenue	661,000	$373,000
Disc Op	.....	(45,000)
Tax Cred	28,000	.....
Earnings	61,000	(111,000)

COMPUTERWORLD Computer Stocks Trading Indexes



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EXCH		1973 RANGE (1)	CLOSE SEP 20 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	211-245	226 3/4	+9	+4.1
N	COLLINS RADIO	16- 26	25 3/8	+ 1/8	+0.4
O	COMPUTER AUTOMATION	5- 16	14 7/8	+2 1/8	+16.6
N	CONTROL DATA CORP	31- 62	41 1/2	+6 1/4	+17.7
O	DATA GENERAL CORP	28- 44	45 1/4	+2 3/4	+6.4
O	DATAPOINT CORP	10- 21	16 1/2	+2 1/8	+14.7
O	DIGITAL COMP CONTROL	2- 6	3 1/8	+ 1/2	+19.0
N	DIGITAL EQUIPMENT	73-105	95	+4 1/4	+4.6
N	ELECTRONIC ASSOC.	4- 9	5 3/4	+1 3/8	+31.4
A	ELECTRONIC ENGINEER.	6- 11	10	+ 5/8	+6.6
N	FOXBORO	23- 43	42 3/4	+3 1/4	+8.2
O	GENERAL AUTOMATION	22- 55	38 1/4	- 1/4	-0.6
O	GRI COMPUTER CORP	1- 3	1 3/4	0	0.0
N	HEWLETT-PACKARD CO	73- 95	80 1/2	+1 1/2	+1.8
N	HONEYWELL INC	98-139	116 1/4	+7 1/4	+6.6
N	IBM	260-340	268 3/4	-23 1/2	-8.0
O	INTERDATA INC	7- 13	10 7/8	+1 7/8	+20.8
N	MEMOREX	2- 19	4 7/8	0	0.0
O	MICRODATA CORP	2- 10	4	+ 1/4	+6.6
N	NCR	27- 38	37 1/4	+2 1/2	+7.1
N	RAYTHEON CO	22- 34	25 3/4	+2 1/4	+9.5
N	SINGER CO	45- 74	52 1/4	+3 1/4	+6.6
N	SPERRY RAND	36- 53	52 5/8	+1 5/8	+3.1
A	SYSTEMS ENG. LABS	3- 8	3 1/4	+ 3/8	+13.0
N	TEXAS INSTRUMENTS	83-123	123	+14 3/4	+13.6
O	ULTIMACC SYSTEMS INC	1- 11	2 3/8	+ 1/4	+11.7
N	VARIAN ASSOCIATES	10- 20	16 1/4	+ 5/8	+4.0
N	WANG LABS.	13- 34	22 7/8	+2 3/4	+13.6
N	XEROX CORP	139-169	147	-1 3/4	-1.1
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	6- 17	5 7/8	0	0.0
O	COMMERCE GROUP CORP	3- 4	3 7/8	+ 1/8	+3.3
O	COMPUTER EXCHANGE	1- 1	3/8	+ 1/8	+50.0
A	COMPUTER INVSTRS GRP	2- 8	2 5/8	+ 1/4	+10.5
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC RENTAL	2- 3	2 1/8	0	0.0
A	DCL INC	1- 3	1 1/8	+ 1/8	+12.5
A	DEARBORN-STORM	12- 26	14 7/8	- 3/8	-2.4
N	DPF INC	5- 9	4 7/8	+ 1/8	+2.6
O	EDP RESOURCES	1- 3	1 3/8	0	0.0
A	GRANITE MGT	2- 6	3 7/8	+ 5/8	+19.2
A	GREYHOUND COMPUTER	3- 6	5	+1 1/8	+29.0
A	ITEL	4- 12	6	+1 1/8	+23.0
N	LEASCO CORP	8- 18	12	+ 1/2	+4.3
O	LEASPAC CORP	1- 8	1	- 1/4	-20.0
O	LECTRO MGT INC	1- 2	5/8	0	0.0
O	NRG INC	5- 15	6 3/8	+ 7/8	+15.9
A	PIONEER TEX CORP	5- 8	5 1/4	+ 3/8	+7.6
A	ROCKWOOD COMPUTER	1- 3	1 1/2	+ 1/8	+9.0
N	U.S. LEASING	16- 36	27 5/8	+3 5/8	+15.1

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1973 RANGE (1)	CLOSE SEP 20 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 5/8	0	0.0
A	APPLIED DATA RES.	2- 4	2 3/8	+ 1/4	+11.7
O	APPLIED LOGIC	1- 3	7/8	0	0.0
N	AUTOMATIC DATA PROC	39- 94	70 3/8	+9 1/8	+14.8
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	6- 9	6 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 5	2	- 1/4	-11.1
O	COMPUTER DYNAMICS	1- 2	3/8	0	0.0
O	COMPUTER HORIZONS	1- 6	2 1/4	0	0.0
O	COMPUTER NETWORK	1- 5	1	0	0.0
N	COMPUTER SCIENCES	2- 6	3 5/8	+ 3/4	+26.0
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1	0	0.0
O	COMPUTER USAGE	4- 9	5 1/4	- 3/8	-6.6
O	COMRESS	1- 2	3/8	- 1/8	-25.0
O	COMSHARE	4- 9	4 1/4	- 1/4	-5.5
N	CORDURA CORP	4- 15	4	+ 1/8	+3.2
O	CYBERNATICS INC	1- 3	1 3/8	- 1/8	-8.3
O	DATATAB	1- 4	1 1/2	0	0.0
A	ELECT COMP PROG	1- 2	3/4	- 1/4	-25.0
N	ELECTRONIC DATA SYS.	29- 56	40 1/4	+3 1/4	+8.7
O	INFONATIONAL INC	1- 2	3/4	0	0.0
O	INFORMATICS	2- 6	4	- 1/2	-11.1
O	I.O.A. DATA CORP	1- 1	5/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	1 1/2	+ 1/8	+9.0
O	KEANE ASSOCIATES	3- 4	3 1/4	0	0.0
O	KEYDATA CORP	6- 12	6 1/8	+ 1/8	+2.0
O	LOGICON	3- 7	4 1/4	+ 3/8	+9.6
A	MANAGEMENT DATA	2- 5	1 5/8	0	0.0
O	NATIONAL CSS INC	18- 42	26 1/2	+2 1/2	+10.4
O	NATIONAL COMPUTER CO	1- 1	3/8	0	0.0
O	NATIONAL INFO SRVCS	1- 2	1/2	0	0.0
P	ON LINE SYSTEMS INC	12- 20	20 3/4	+ 3/4	+3.7
N	PLANNING RESEARCH	2- 7	3 1/4	+ 3/8	+13.0
O	PROGRAMMING METHODS	21- 25	21	0	0.0
O	PROGRAMMING & SYS	1- 1	7/8	0	0.0
O	RAPIDATA INC	5- 24	5 3/8	+ 5/8	+13.1
O	SCIENTIFIC COMPUTERS	1- 3	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 4	1 1/4	+ 1/8	+11.1
O	TRS COMPUTER CENTERS	2- 4	2 1/2	+ 3/4	+42.8
O	TCC INC	1- 1	3/8	0	0.0
O	TYMSHARE INC	6- 12	11 1/2	+1 3/4	+17.9
O	UNITED DATA CENTER	4- 6	3 1/4	- 1/4	-7.1
A	URS SYSTEMS	4- 8	3 5/8	0	0.0
N	WYLY CORP	4- 11	5	+ 1/8	+2.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	12- 34	14	+1 3/4	+14.2
O	ADVANCED MEMORY SYS	5- 23	8 1/4	+3 1/4	+65.0
N	AMPEX CORP	4- 7	4 7/8	+ 1/4	+5.4
O	ANDERSON JACOBSON	3- 6	3 3/4	0	0.0
O	BEEHIVE MEDICAL ELEC	5- 10	7 1/2	+ 1/2	+7.1
A	BOLT,BERANEK & NEW	6- 12	7 1/2	+1 3/4	+30.4
N	BUNKER-RAMO	6- 18	10 1/4	+1 1/8	+12.3
A	CALCOMP	5- 13	12 3/4	+3 3/8	+36.0
O	CAMBRIDGE MEMORIES	8- 15	16 1/4	+1 3/8	+9.2
O	CENTRONICS DATA COMP	13- 36	36	+4	+12.5
O	CODEX CORP	9- 19	12	+ 1/2	+4.3
O	COGNITRONICS	1- 3	1 5/8	0	0.0

EXCH		1973 RANGE (1)	CLOSE SEP 20 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER COMMUN.	1- 4	3/4	- 1/8	-14.2
A	COMPUTER EQUIPMENT	2- 3	2	+ 1/8	+6.6
O	COMPUTER MACHINERY	5- 13	8	+1 1/2	+23.0
O	COMPUTER TRANSCEIVER	1- 6	1 7/8	- 1/8	-6.2
N	CONRAC CORP	15- 32	17 1/2	+2 3/4	+18.6
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	9- 18	15 1/8	+2 3/4	+22.2
A	DATA PRODUCTS CORP	2- 4	4 1/8	+ 3/4	+22.2
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	2- 5	2 1/2	+ 3/8	+17.6
O	DECISION DATA COMPUT	8- 40	14 1/2	+1 1/4	+9.4
O	DELTA DATA SYSTEMS	1- 1	1/2	+ 1/8	+33.3
O	DI/AN CONTROLS	1- 4	1 5/8	+ 1/8	+8.3
N	ELECTRONIC M & M	3- 6	4 3/8	+ 1/4	+6.0
O	FABRI-TEK	2- 5	3 3/8	+ 5/8	+22.7
O	GENERAL COMPUTER SYS	5- 9	6 1/2	- 1/2	-7.1
N	GENERAL ELECTRIC	56- 76	62 3/8	+5 5/8	+9.9
N	HAZELTINE CORP	5- 9	7	+1 1/8	+19.1
O	INFOREX INC	5- 23	5 3/8	-1 7/8	-25.8
O	INFORMATION DISPLAYS	1- 2	1/4	0	0.0
O	INFORMATION INTL INC	10- 15	12	-1 3/4	-12.7
A	LUNDY ELECTRONICS	3- 9	3 7/8	- 1/8	-3.1
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
A	MILGO ELECTRONICS	14- 28	22 1/8	+5	+29.1
N	MOHAWK DATA SCI	4- 13	6 3/8	+ 3/4	+13.3
O	ODEC COMPUTER SYST.	2- 6	2	0	0.0
O	OPTICAL SCANNING	2- 8	6 1/2	0	0.0
O	PERTEC CORP	4- 8	4 1/4	0	0.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 9	5 3/4	+1 5/8	+39.3
O	PRECISION INST.	2- 6	3	0	0.0
O	QUANTOR CORP	5- 10	7	+ 3/4	+12.0
O	RECOGNITION EQUIP	4- 8	4 3/4	- 3/4	-13.6
N	SANDERS ASSOCIATES	7- 18	11 1/4	+2 1/2	+28.5
O	SCAN DATA	1- 6	2 3/8	+ 3/8	+18.7
O	STORAGE TECHNOLOGY	11- 34	20 3/8	+6	+41.7
O	SYCOR INC	9- 15	17	+2 1/2	+17.2
O	TALLY CORP.	2- 14	5	+ 5/8	+14.2
O	TEC INC	6- 9	6 3/4	+ 1/2	+8.0
N	TEKTRONIX INC	30- 53	50 7/8	+4 7/8	+10.5
N	TELEX	3- 8	6 1/2	+2 1/4	+52.9
O	WANGCO INC	7- 13	11	+2 1/2	+29.4
O	WILTEK INC	8- 18	12	+1 1/2	+14.2
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	5 1/4	0	0.0
A	BARRY WRIGHT	6- 13	7 7/8	+1 1/8	+16.6
A	DATA DOCUMENTS	17- 22	20 1/2	+ 3/8	+1.8
O	DUPLEX PRODUCTS INC	7- 10	7 7/8	- 1/8	-1.5
N	ENNIS BUS. FORMS	5- 8	5 3/4	+ 1/8	+2.2
O	GRAHAM MAGNETICS	9- 20	12 3/4	+ 1/2	+4.0
O	GRAPHIC CONTROLS	8- 12	9 5/8	- 3/8	-3.7
N	3M COMPANY	78- 89	84 3/4	+ 7/8	+1.0
O	MOORE CORP LTD	53- 60	56 1/4	+ 3/4	+1.3
N	NASHUA CORP	42- 58	51 5/8	+ 1/8	+0.2
O	REYNOLDS & REYNOLD	40- 51	46 3/4	+1 3/4	+3.8
O	STANDARD REGISTER	14- 20	16	+ 1/2	+3.2
O	TAB PRODUCTS CO	8- 23	12	+1 1/2	+14.2
N	UARCO	15- 23	16	0	0.0
A	WABASH MAGNETICS	5- 7	6 1/4	- 1/8	-1.9
N	WALLACE BUS FORMS	15- 26	19 7/8	- 1/2	-2.4

We would suggest you compare the Hazeltine 1000 with other teletypewriter-compatible CRT Terminals at its price* ...if there were any.

The Hazeltine 1000 Terminal features a 960-character display (80x12), your choice of transmission speeds up to 9600 bps as well as parity generation and checking. Options include upper/lower case, answerback and an auxiliary EIA output. All at a price that fits easily into your budget.

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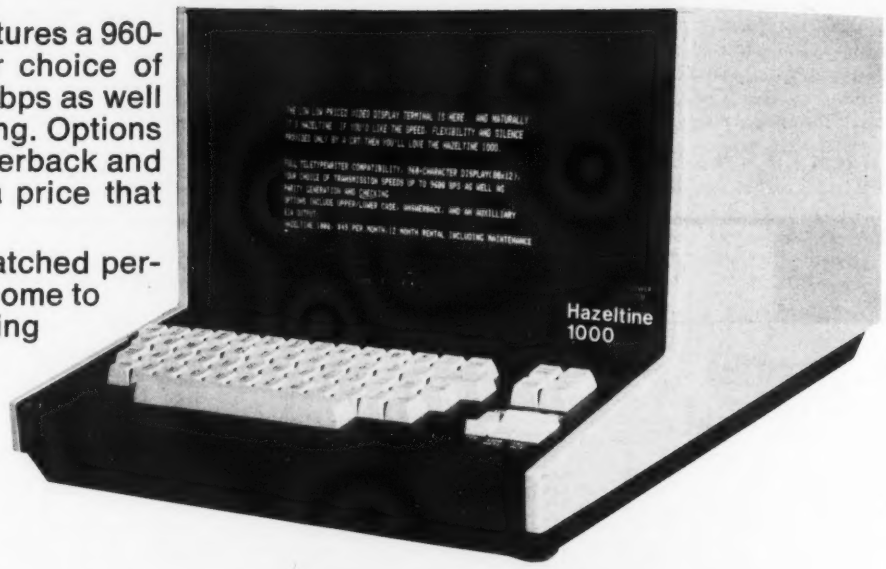

Hazeltine 1000 *$49 mo.

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